amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

VOL. 48, No. 1 JANUARY 1980

FEATURED IN THIS ISSUE:

- ★ INEXPENSIVE HIGH IMPEDANCE MULTIMETER
- ★ THE EVEN SIMPLER REGULATOR
- ★ REPLACING THAT UNUSUAL 'JA' TRANSISTOR
- ★ ELECTRONICS—ITS PART IN MY DOWNFALL
- ★ JOHN MOYLE MEMORIAL FIELD DAY CONTEST—RULES—1980

Registered for posting as a Publication — Category "B".

VICOM: THE ONE STOP COMMUNICATIONS SHOP!

Daiwa Low Pass Filters

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BL70A	70 ohm, 4 KW, 1:1 for dipoles — $32.00

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LAG26	Audio Generator — $166.00

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MK701	Manipulator (side-swiper) — $45.00
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PBM 18/70	18 el, 70 cm, 14.9 dBd, 2.8 m — $96.00
MBM 48/70	48el, 70 cm, 15.7 dBd, 1.83 m — $83.00
MBM 88/70	88el, 70cm, 18.5 dBd, 3.98 m — $105.00
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CX-2H	1.8 thru 450 MHz, 200 w pep — $69.00

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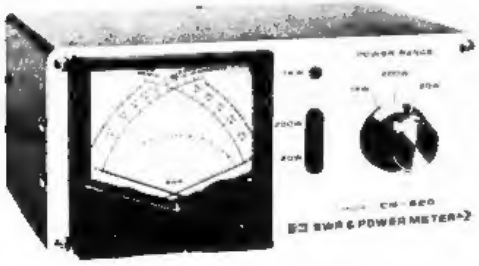

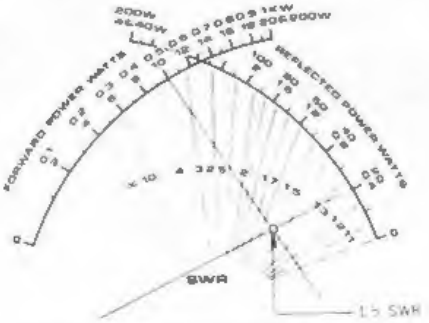

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Published monthly as its official journal by the Wireless Institute of Australia, founded 1910.

amateur radio

JANUARY 1980
VOL. 48, No. 1

PRICE: $1.20

Registered Office:
3/105 Hawthorn Road,
Caulfield North 3161.

Enquiries and material to:
The Editor,
PO Box 150, Toorak, Vic. 3142

Copy is required by the first of each month. Acknowledgement may not be made unless specially requested. All important items should be sent by certified mail. The editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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Typesetting: MUELLER INDUSTRIES
1a Levanswell Road, Moorabbin, 3189
Tel.: 553 0292

Printers: EQUITY PRESS PTY. LTD.
50-52 Islington Street, Collingwood, 3066
Tel.: 41 5054, 41 5055

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Cover Photo

John Tuppen VK6XJ and his youngest daughter Ann discuss a few of the finer points of amateur radio. See John's article "Electronics, It's Part of My Downfall" on page 18.

WIANEWS

6m BAND

This is the text of a letter sent to the P. & T. Department in October —

"On 18th August 1977 a letter was addressed to you in connection with the use of the 50-52 MHz band in Australia on a non-interference basis by the Amateur Service. A copy of this letter is attached for ready reference. This subject has been discussed with Departmental officers on numerous occasions, both before and after the above letter was sent, especially at Joint Committee meetings.

Having regard to the rising solar activity of Cycle 21 there are many licensees involved, and becoming involved, in the observation of extended propagation at VHF frequencies. The fact that amateurs in many countries enjoy the use of the full ITU Regions 2 and 3 amateur exclusive allocation of 50-54 MHz places Australian operators at a great disadvantage, being limited only to 52-54 MHz.

Propagation has already occurred one way on several occasions over such unusual paths as Hawaii-Perth and Los Angeles-Perth on 50.1 MHz but not only does the frequency disparity of 2 MHz present operational difficulties it is evident that propagation performance differs considerably between 50 and 52 MHz.

These factors are an almost insurmountable handicap in achieving two-way communication which is considered essential to the ultimate confirmation that a circuit has been completed between the terminals of interest.

Delay beyond a few months or even weeks will limit the amount of first hand experience of unusual propagation that may be gained.

Application is now made for the immediate use by the Amateur Service in Australia on a year to year basis of at least the segment 50.0 to 51.0 MHz of the Region 3 allocation except

(a) where interference would be caused to operational TV Channel 0 stations (i.e., amateurs be allowed this segment outside the service areas of TVO transmitters and translators);

(b) on spot frequencies already assigned to, and in use by, the Secondary Service in any particular service area.

The technique at (b) above is one which is used in many countries on various frequency bands but more specifically in relation to Hong Kong on 52.025-52.100 MHz and the USA on the 1.8 MHz band.

Operators licensed in the Amateur Service traditionally have been to the forefront in bringing to light new factors in propagation phenomena; factors which of course have properly been the subject of later intensive examination by those engaged professionally in the field. We refer to examples such as tropospheric propagation beyond the horizon at VHF and VHF Trans-Equatorial Scatter propagation via the ionosphere, Radio Astronomy, etc.

By reason of their numbers and geographic distribution amateur stations are in a specially favourable position to observe and record details of unusual propagation phenomena on usable frequencies of reasonable commonality with other countries.

It might be difficult to provide an Australia-wide concession but the request is made that this question be discussed with you

at the very earliest opportunity, particularly in reference initially to specific areas or States, such as Western Australia and Northern Territory."

No response having been received the following reminder was despatched on 7th November —

"I am instructed to refer to my letter dated 12th October to which no response has been received.

Information has now been received that in New Zealand the amateur service is allegedly authorised the use on a restricted basis of the segment 50 to 50.15 MHz during hours when no television stations are operating.

It is therefore requested that a very early discussion with the Department on this matter be authorised."

Despite telephone enquiries no response to either letter was to hand by the 3rd week in November when this was written.

It is reliably reported that the Minister for Post and Telecommunications recently wrote to an M.P., in response to enquiries, that the W.T. Act does not provide for control over the importation and sale of radio communications equipment but the proposed new legislation, to be introduced as soon as possible, will provide such controls.

Apparently the Minister conferred with Business and Consumer Affairs for the possible use of the Trade Practices Act and the Customs Act. Nothing eventuated under the former, but the latter could be used to prevent the importation of unlicensable equipment and action is being taken under the Customs (Prohibited Imports) Regulations to prohibit the import of unlicensable 27 MHz CB transceivers.

For equipment already in Australia the only practicable control over sales appears to be the proposed new radio regulations.

At the Executive meeting in November it was observed that, in relation to the suppression of address or other call sign details as requested by holders of call signs, this was in fact a prerogative of the P. and T. Department having regard to the contract the Institute possesses for printing the call book.

It has been reported that an amateur received a solicitor's letter about interference with a neighbour's TV, radio and stereo. The amateur concerned apparently had done all the right things not only to assist with filters but also had his own gear checked and cleared, apparently as satisfactory. Nonetheless the neighbour appears to have taken legal advice, hence the solicitor's letter which stated that the nature of the interference was most substantial and was really an invasion of privacy for which they were prepared to obtain an injunction from the Supreme Court to prevent him from transmitting during certain hours. This matter is being pursued as it is of great concern to all amateurs.

Definite news has come to hand that the morse code exam markings would be split for the November exam onwards. This means, for example, that anyone obtaining a pass in the sending part would not be required to pass this part again within the ensuing 12 months — he would only be required to obtain a pass in the receiving part to be given a pass in morse within that one year.

This resulted from a firm request to the Department by the Institute and may well be in the Department's favour too in relation to the number of candidates at future examinations. The principle applies to both novice and full call speeds and credits back to November 1978 will be given at the November 1979 exam.

The Executive wishes to acknowledge with grateful thanks the receipt of the following donations from members towards the expenses of WARC 79 —

LIST No. 8

VK3PE	*$2.00*
VK2BHO (accidentally omitted from earlier lists)	*10.00*
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Divisional Information (all broadcasts are on Sundays unless otherwise stated).

ACT:
President — Mr. A. Davis VK1DA
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Broadcasts— 3570 kHz and 2m Ch. 6 (or 7): 10.00Z.

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Broadcasts— 1825, 3595, 7146 kHz, 28.32, 52.1, 52.525, 144.1, 145.6, 146.4, Rptr. Ch. 3 — Gosford, Ch. 4 — Lismore, Ch. 5 Wollongong, Ch. 8 — Dural 11.00h local (Evening 0930Z). Relays on 160, 80 and 10m, VHF and Reptr. Ch. 3, Ch. 5, Ch. 8, and Hunter Branch, Mondays 0930Z on 3595 kHz, 10m, and Ch. 3 and 6. RTTY Sunday 0030Z 7045, 14090 kHz, Ch. 52, 0930Z 3545 kHz, Ch. 52.

VIC.:
President — Mr. E. J. Buggee VK3ZZN
Secretary — Mr. G. F. Atkinson VK3YFA
Broadcasts— 1840, 3600, 7135 kHz — 53.032 AM, 144.2 USB and 2m Ch. 2 (S) repeater: 10.30 local time.
Gen. Mtg. — 2nd Wed., 20.00.

QLD.:
President — Mr. A. J. Aarsse VK4QA
Secretary — Mr. W. L. Gialis VK4ABG
Broadcasts— 1825, 3580, 7146, 14342, 21175, 28400, kHz; 2m (Ch. 42, 48): 08.00 EST.
Gen. Mtg. — 3rd Friday.

SA:
President — Mr. I. J. Hunt VK5QX
Secretary — Mr. W. M. Wardrop VK5AWM
Broadcasts— 1820, 3550, 7095, 14175 kHz; 28.5 and 53.1 MHz, 2m (Ch. 8): 09.00 S.A.T.
Gen. Mtg. — 4th Tuesday, 19.30.

WA:
President — Mr. Ross Greenaway VK6DA.
Secretary — Mr. Peter Savage VK6NCP.
Broadcasts— 3560, 7075, 14100, 14175 kHz. 28.485, 52.290 MHz. 2 metres Ch. 2 Perth, Ch. 6 Wagin. Time 0130Z.
Gen. Mtg. — 3rd Tuesday.

TAS.:
President — Mr. I. Nicholls VK7ZZ
Secretary — Mr. P. T. Blake, VK7ZPB
Broadcasts— 7130 (AM) kHz with relays on 2m Ch. 2 (S), Ch. 6 (N), Ch. 3 (NW), 09.30 EST.

NT:
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Secretary — Robert Milliken VK8NRM
Broadcasts— Relay of VK5WI on 3.555 MHz and on 146.5 MHz at 2330Z. Slow morse transmission by VK8HA on 3.555 MHz at 1000Z almost every day.

Postal Information:
VK1 — P.O. Box 46, Canberra, 2600.
VK2 — 14 Atchison St., Crows Nest, 2065 (Ph. (02) 43 5795 Tues & Thurs (10.00-14.00h). P.O. Box 123, St. Leonards, NSW 2065.
VK3 — 412 Brunswick St., Fitzroy, 3065 (Ph. (03) 41 3535 Weekdays 10.00-15.00h).
VK4 — G.P.O. Box 638, Brisbane, 4001.
VK5 — G.P.O. Box 1234, Adelaide, 5001 — HQ at West Thebarton Rd., Thebarton.
VK6 — G.P.O. Box N1002, Perth, 6001.
VK7 — P.O. Box 1010, Launceston, 7250.
VK8 — (Incl. with VK5), Darwin AR Club, P.O. Box 37317, Winnellie, N.T., 5789.

Slow morse transmissions — most week-day evenings about 09.30Z onwards around 3550 kHz.

VK QSL BUREAUX

The following is the official list of VK QSL Bureaux, all are inwards and outwards unless otherwise stated.

VK1 — QSL Officer, G.P.O. Box 46, Canberra, A.C.T. 2600.
VK2 — QSL Bureau, C/- Hunter Branch, P.O. Teralba, N.S.W. 2284.
VK3 — Inwards QSL Bureau, Mr. E. Trebilcock, 340 Gillies Street, Thornbury, Vic. 3071.
VK3 — Outwards QSL Bureau, Mr. R. R. Prowse, 83 Brewer Road, Bentleigh, Vic. 3204.
VK4 — QSL Officer, G.P.O. Box 638, Brisbane, Qld., 4001.
VK5 — QSL Bureau, Mr. Geo. Luxon VK5RX, 203 Belair Road, Torrens Park, S.A. 5062.
VK6 — QSL Bureau, Mr. J. Rumble VK6RU, G.P.O. Box F319, Perth, W.A. 6001.
VK7 — QSL Bureau, G.P.O. Box 371D, Hobart, Tas. 7001.
VK8 — QSL Bureau, C/- VK8HA, P.O. Box 1418, Darwin, N.T. 5794.
VK9, 0 — Federal QSL Bureau, 23 Landale Street, Box Hill, Vic. 3128.

Editor's Desk

Bruce Bathols VK3UV

At this time of the year, most people pause for a moment to reflect on the year's performance.

What have we as amateurs **achieved** in 1979?

Let us have a look at our hobby first, then the WIA and AR.

As far as the hobby is concerned one would have to be honest and say "Virtually nothing new or different from last year".

Why is this?

Certainly many new amateurs have joined our ranks and some further advances have been made in technology.

It is apparent that we amateurs are content to plod along with our "black boxes" and take things as they come.

What has happened to home-brew? Apart from a few isolated cases from the die-hards, if anything, it has taken a decline.

With the high cost of components and the specialities required to build "state of the art" equipment, for most of us it is more economical to purchase equipment "off the shelf". Yes! I even fall into that category myself — a "black box" operator.

To keep the record straight, perhaps it should be stated what it is that we actually do with our "black boxes".

Apart from some basic experimentation with antenna systems and investigations into the VHF spectrum, etc., we have evolved into a race of "specialist communicators".

Our techniques and abilities are second to none and we are always willing and organised to handle any civil emergency communications network should the need arise. (Strange thought I seem to hear the same claim from NDO, CES, State Police, and even CREST!!)

Perhaps it is time that we took stock of ourselves?? Certainly I do not have the answers, but amateurs collectively and working together through the WIA have a much better chance of improving our public image.

We become "'ambassadors" each time we speak into a microphone — whatever we say on the air becomes instant "public property". The countless ears of the world monitor us.

It therefore behoves us to conduct ourselves with decorum, and to stop and think for a moment before polluting the air waves with waffle. We should encourage and teach new amateurs correct procedures before any bad habits become established.

The future of amateur radio is in our own hands — let us all make the most of it.

Let us now look at the WIA and Amateur Radio magazine.

1979 has shown a steady growth, with membership only a few short of the 6,000 mark. Approximately 55 per cent of Australian amateurs are WIA members, this compares most favourably with other overseas amateur societies where membership is voluntary and not a condition of an amateur licence.

Naturally we would like a much higher percentage, as this would give the Institute extra "teeth" to complete negotiations with the authorities more effectively.

One of the greatest efforts of the WIA is the WARC preparation, and member representation at Geneva. This was a very costly exercise but vital to our survival. The full result will not be known for a little time yet, but we are always very optimistic.

We thank all members and supporters for their efforts in helping us with the WARC preparations and costs.

A lot of work goes on behind the scenes and this is primarily done by volunteers in the various Divisions and Executive office.

The Executive office is becoming overloaded with daily enquiries, but progression is all around us, and this includes your magazine "Amateur Radio" — affectionately known over the years as AR.

Since the first issue of AR was published, it has been under the direction of a hard working volunteer committee.

Of late, the work involvement of the editorial staff has reached such proportions as to become quite a personal burden for several members.

At the last Federal convention a long range plan was devised to centralise all aspects of AR production. As a result, Executive have appointed Mark Stephenson VK3NOY as a permanent salaried Executive staff officer. Mark's main duties will be the publication of AR, and he will take over effective control of all aspects of our magazine from 1st January, 1980.

Naturally producing a magazine the quality of AR requires much assistance from our members.

We require photographs and novice material in particular.

We look forward to our members' full support and wish Mark well in his new venture.

VK3UV. ■

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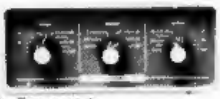

HC-7S. Tokyo Hy-Power Labs. Transmatch 75W PEP. $69
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INEXPENSIVE HIGH-IMPEDANCE MULTIMETER

G. J. Hunt VK3ZIX
19 Menzies Close, Frankston 3199

In this age of digital devices it is reasonable to ask whether the construction of an analogue multimeter is still justified. A quick look around would seem to indicate a definite yes. You can buy small ones from about $10, very good ones cost hundreds. The unit described here can be built for approximately $35 (allowing $13 for a good quality movement) and has features found on instruments costing twice as much. These are:

- **Sensitivity 100,000 ohms/volt, all ranges.**
- **Single linear scale for all voltage and current ranges, AC and DC.**
- **8 volts ranges. 0.1 to 500V, AC and DC.**
- **7 current ranges. 10 uA to 10A, AC and DC.**
- **5 ohms range. 1 ohm to 10 megohms approx.**
- **"Automatic" meter protection (explained later).**
- **Uses inexpensive and readily available parts. No complicated switching arrangements.**
- **AC response 3 dB down at 12 kHz.**

High Impedance Multimeter.

OPERATION

The design centres around a 1 mA meter movement driven by a 741 op amp such that 100 mV input will cause 1 mA to flow through the meter. Under these conditions the current through the input resistor R1 is 10 uA; hence we have a basic movement with a sensitivity of 100k ohms per volt. (If R1 is made 100k then 1 megohm/volt is possible but this was rejected due to zero offset and noise problems and the need for excessively large multipliers, e.g. the 500V range would require 500M ohms which is difficult to obtain.)

The op amp will also pass AC, so for these readings the meter is switched across a diode bridge. Any non-linearity in the diodes will be compensated for by the feedback circuit of the amplifier. (This bridge could be left in circuit for DC readings but then it would not be possible to determine whether the voltage being measured was AC or DC.) The output voltage is developed across R2. To read true RMS (AC) this must be reduced to 90.03 ohms. This is done by switching in the compensation trimpot RV3.

The two diodes from the amp input to COMMON afford some protection in the event of a severe overload. The current through the meter itself is limited by R3 to about 3 mA under the worst conditions.

The 18V supply comes from two small 9V rectangular transistor radio batteries. A modest consumption of 800 uA plus the meter current should ensure long life. Accuracy of reading was maintained until either or both battery voltages fell to less than 6.3 volts.

CONSTRUCTION

All the components for the meter amp and also the ohms ranges resistors are mounted on a PCB which bolts directly on the meter terminals. The board layout is reproduced here, but note that the hole spacing is for a 4½ inch panel meter and may not suit the one you use. Use a socket for the 741, for reasons to be explained later.

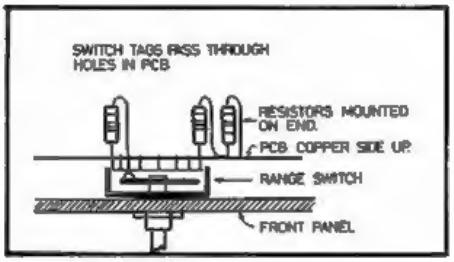


FIG. 1: Switch Details.

In the prototype a separate PCB was made to fit over S1, S2 and S4. The multipliers and shunts were then mounted on this board, see Fig. 1. However due to the possible variations in switch types, layouts and case sizes it was considered pointless reproducing this. The general principle only is shown here.

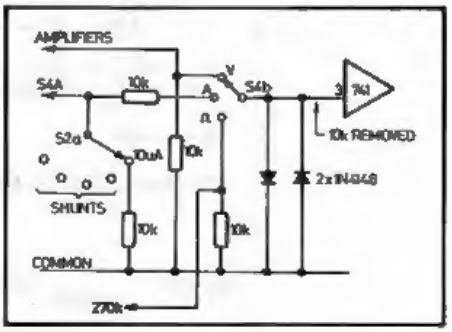


FIG. 2: Input Circuit.

If you use a PCB like this, make it of fibreglass (to reduce capacitive effects) and leave plenty of "pads" around the volts range switch to allow series connection of the multipliers. The 50M resistance for the 500V range consists of

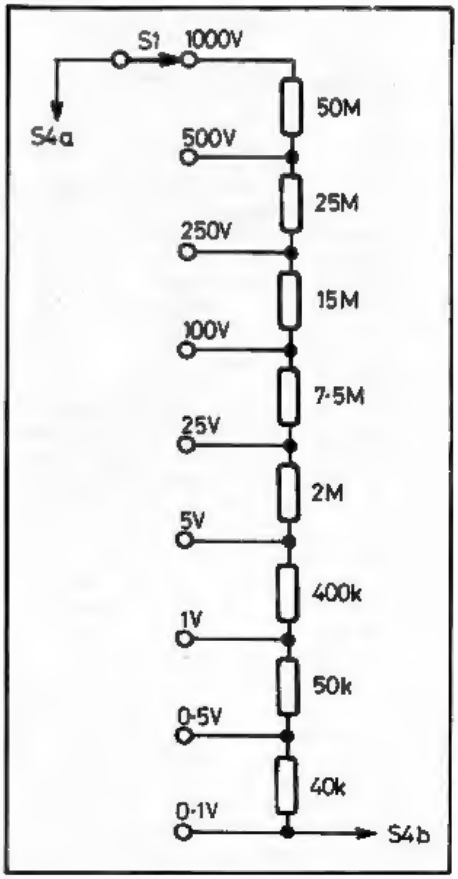


FIG. 3: DC Divider.

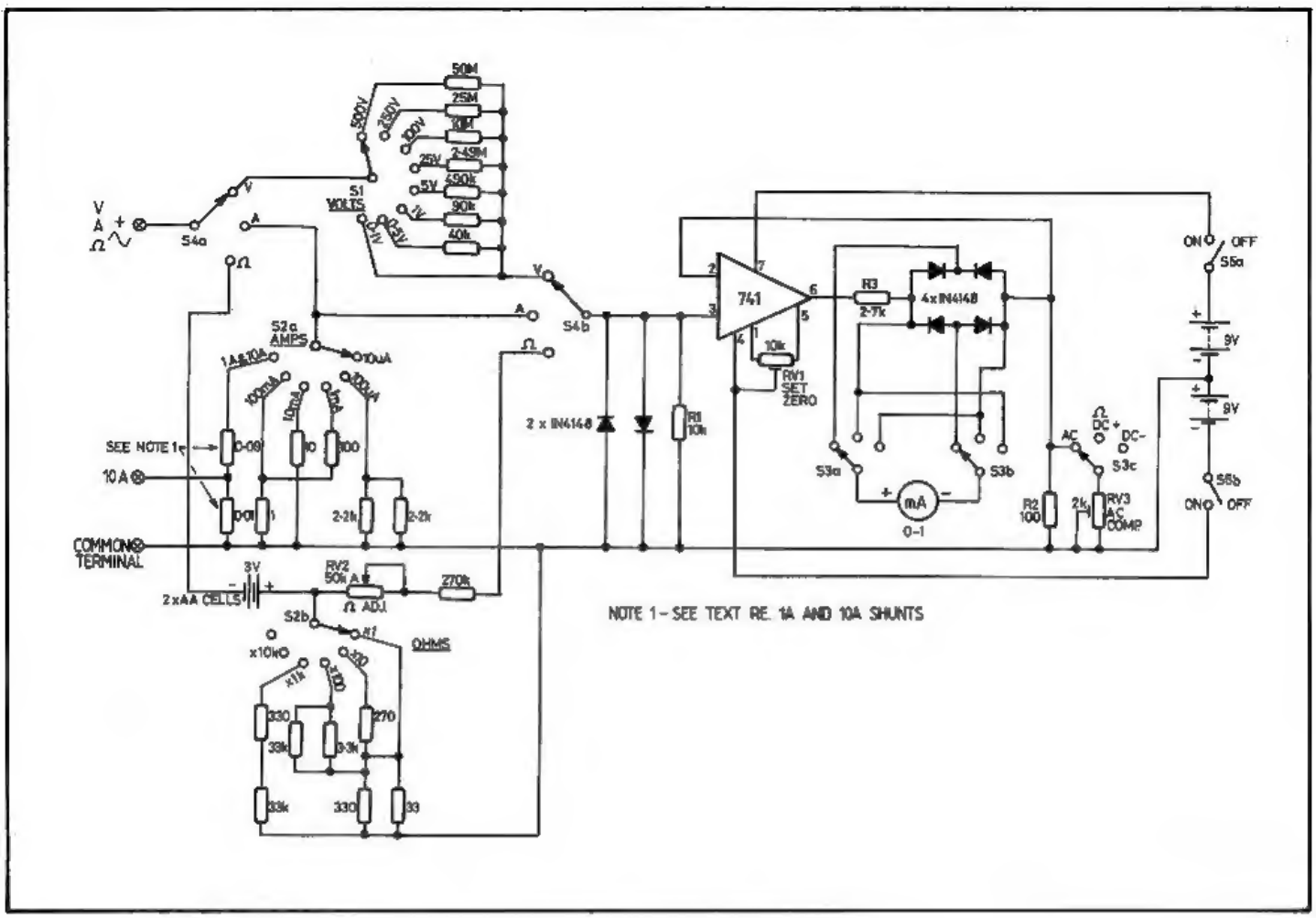
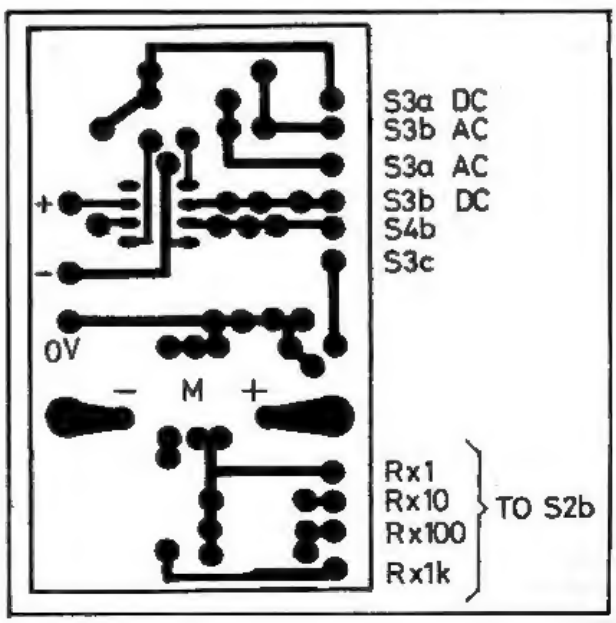


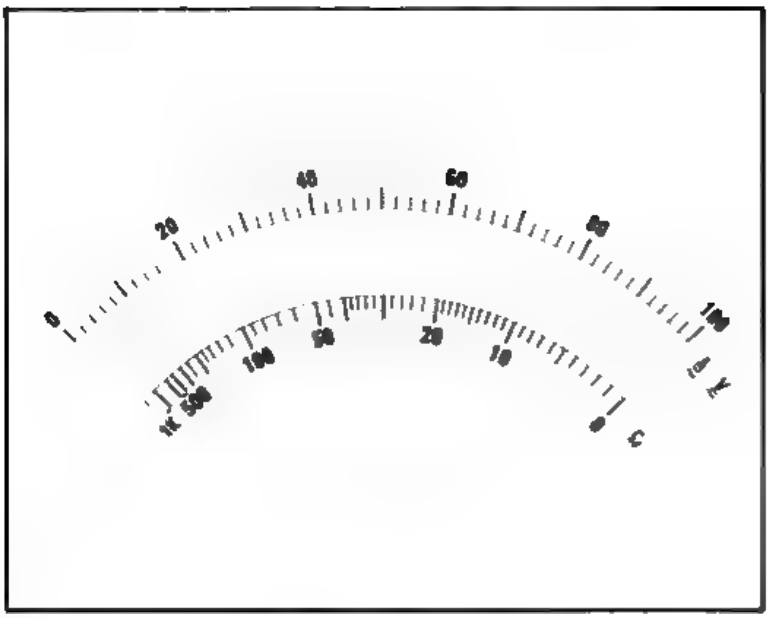
FIGURE 4: Multimeter Circuit Diagram.

5 x 10M + 3.3M in series, the latter because the 10M resistors were ± 10 per cent tolerance and all measured low! Some trimming of values will be necessary if accuracy is to be realised. We used a Digital Multimeter on the ohms range to get them as close as possible then checked the working unit against the same DMM on volts and amps. Accuracy and linearity were surprisingly good, the main limiting factor being the meter itself. The 1A shunt was made from several strands of electric jug element and is best worked out by experiment. The 10A shunt consists of 440 mm of 15 amp fuse wire, doubled (to make it 220 mm long), wound on a 2 watt carbon resistor and connected directly across the 10A and COMMON terminal posts.

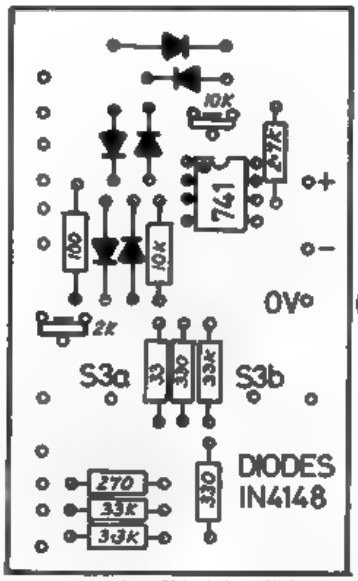
All the switches except S3 were obtained from Tandy Electronics. S2a is modified by removing the insulation between contacts to make it bridging; this prevents the shunts going open if ranges are changed during a current reading. It will be noticed that on the 1A range this current actually flows through S2a and S4a. No problems have occurred in practice, but if this is felt undesirable then the solution is to either use heavy duty



Amplifier PCB, Copper Foil Side.
Scale: Full Size.



ABOVE
Meter Scale.
Scale: Full Size.



RIGHT
Component Placement on PCB.

switches or bring the 1A range out to a separate terminal. In the interest of cost cutting this was not done on our version.

SETTING UP

Switch on, select volts and adjust RV1 for zero. Set S2 to one of the higher AMPS ranges and switch S4 to AMPS. If there is any change in the zero reading, try another 741. We found a wide variation in the amount of offset between different ICs. The best one of all was labelled 741CP and the variation with this was negligible. Type 741K was also good. Several 741CNs had enough offset to cause a reading error of nearly 3 per cent. If you cannot obtain the better type, the circuit mod. (Fig. 2) should cure the problem on all but the 10 uR range.

Some final remarks about the design. As an ohmmeter the unit feeds out negative on the positive lead as is the convention. But testing of semi-conductors is less of a hassle if the potentials agree with the lead colours. This can be done quite simply by reversing the connections to the 3V "ohms" battery and using the "DC minus" setting of S3 for ohms.

The ohms adjust pot. RV2 is provided to compensate for the internal resistance of the 3V battery. If a regulated supply capable of 100 mA at 3 volts were built in then this control could be omitted from the front panel.

The meter was basically intended for low voltage work and so a 1000V range is not shown. Individual multipliers for each range are used because this way it is possible to trim one range without changing any other. If a 1000V position is needed, it would be better to use series multipliers; Fig. 3 shows this arrangement.

NOTES ON THE PHOTOGRAPHS

All components are mounted on the inside of the front panel, making it possible to lift the entire unit out of its box without any connecting lead problems. The 3 volt battery holder (above the meter) attaches to the panel with a small hinge and will fold down flat for removal of the cells.

PARTS LIST

Case to suit meter (ours measured 235 x 145 x 65 mm to house a 4½ in. (120 x 110) meter)
0-1 mA meter.

SWITCHES

1 1-pole 12-position rotary (8 positions only used).
2 2-pole 5-position rotary (3 positions only used on S4).
1 3-pole 3-position rotary
1 DPST miniature toggle.

SEMI-CONDUCTORS

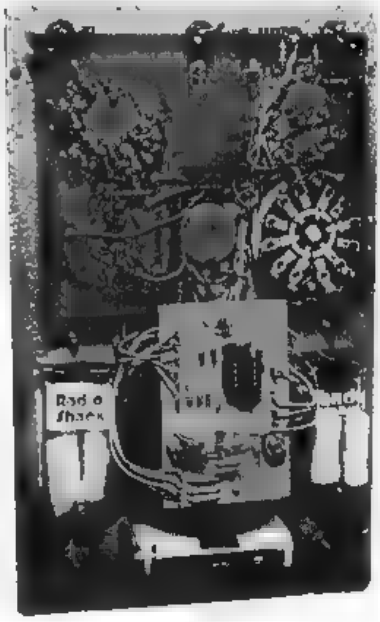
1 741 op amp (see text).
8 1N4148 diodes.

RESISTORS (all ¼W)

1 x 270k, 2 x 100 ohm, 1 x 2.7k, 1 x 10k, 2 x 2.2k, 1 x 10 ohm, 1 x 1 ohm, 1 x 33 ohm, 1 x 270 ohm, 2 x 330 ohm, 1 x 3.3k, 2 x 33k, 5 x 10M, 1 x 2.2M, 2 x 470k, 1 x 22k, 1 x 82k, 1 x 8.2k, 1 x 39k, plus various values for trimming
1 50k linear potentiometer.
1 Trimpot 10k.
1 Trimpot 2k.
15 amp fuse wire.

MISCELLANEOUS

Printed Circuit Board.
2 x 1.5V Penlight Cells. 1 Battery Holder to suit.
2 x 9V Batteries. S-008P or equivalent.
Battery clips, PCB pins, hookup wire, solder, knobs, test leads, etc.
3 Terminals, 2 red, 1 black.
1 x 8-Pin DIL socket.



Inside the Multimeter.

The 1A shunt is in the foreground between the 10A pad and S2. The 10A shunt can just be seen under the board at the bottom of the picture.

The meter turned out to be 900 uA, so there is an 820 ohm resistor across the terminals.

The scale (copy included) was photographically produced from a text book; it was then masked out and enlarged to the required size. ■

"THE EVEN SIMPLER REGULATOR"

Denzil Roden VK2BXF
7/169 Herring Rd., N Ryde 2113

A large percentage of amateurs attempt construction of power supplies. However, from reports heard "on-air" or via other lines of communication, many run into strife. This is avoidable, as the author shows.

Most circuits published are based on the uA723 integrated circuit regulator and it is around this device that most construction problems occur: confusion regarding pin numbering, incorrect orientation of package on PC board, wrongly cut tracks on Vero board, accidental assassination by short circuiting with meter probes, are the most common.

From commercial experience with vast quantities of uA723 chips of various manufacture, the writer has found them to be not the most reliable of beasts, being prone to self-oscillation, noise generation or simply suicidal. On a production line it is convenient to stamp such rogue components into the floor but the tighter budget of Mr. Amateur does not allow such flexibility.

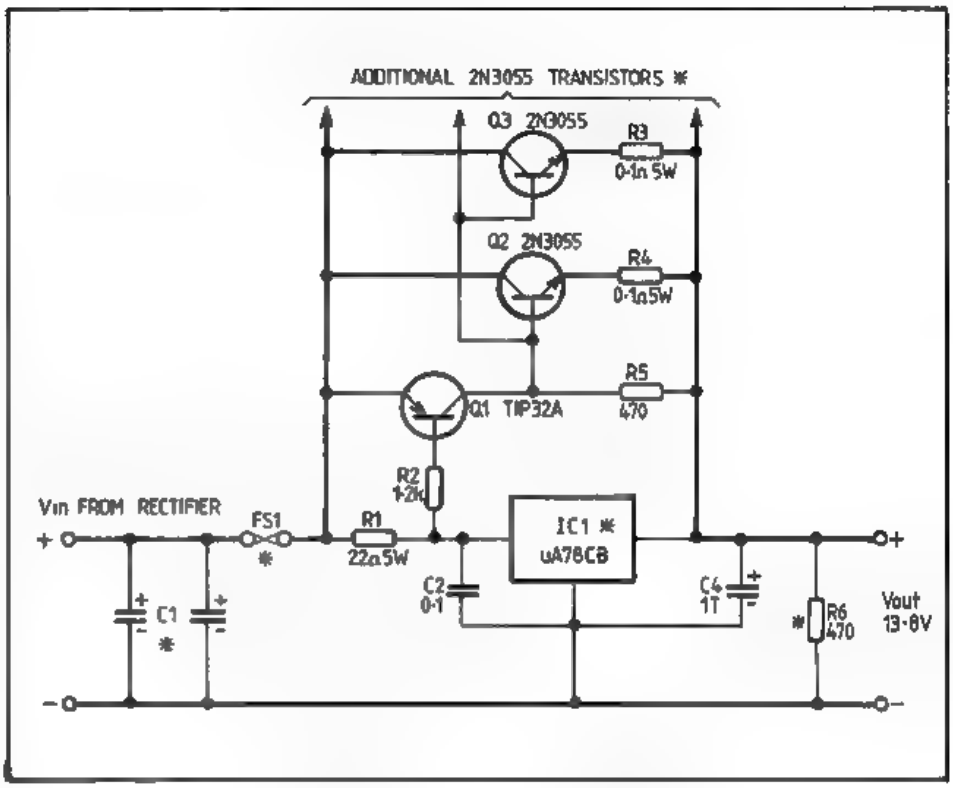
Consequently the writer decided to attempt production of a regulator design to overcome such difficulties. The objectives were:—

1. Simplicity of construction: eliminate need for printed circuit board or similar sub-assembly.
2. Low cost.
3. Versatility: adaptable for various output voltages or as a variable supply.
4. Wide dynamic range, with minimal, if any, circuit change.
5. Reliability: capable of continuous operation at full design current rating.
6. Regulation: equal to or better than previous designs.

With the circuit described, all the above aims have been met or bettered.

The regulator shown in Fig 1 will deliver up to 6 amps at 13.8 volts, suitable for most needs such as powering the popular VHF transceivers to about 30 watts output.

Higher current capacity can be obtained simply by adding more 2N3055 transistors, with emitter resistors, in parallel with the two shown. For example, six additional transistors will raise the output capability to 20 amps, with no other circuit changes whatever. (Obviously transformer, rectifier, filter capacitors, wiring, etc., must be upgraded too.)



The current ratings are continuous and not intermittent, as in many commercial regulators sold for amateur applications.

Transformer and rectifier connections follow standard circuitry so have been omitted from Fig. 1. However details of suitable components are given in the text, together with some useful performance information.

The heart of the circuit is a three terminal 1 amp regulator integrated circuit, which defines the output voltage. C3 bypasses R7 to reduce ripple modulation of the IC common terminal, D1 routes the discharge path of C3 around the IC. C2 and C4 should be mounted as close to the IC terminals as is convenient. The 2N3055s driven by the PNP transistor, provide current amplification. R6 defines a minimum load current required by this particular circuit for reliable operation.

Several regulators have been built in 6 amp and 20 amp versions and have been extensively tested with no problems. 20 amp regulators have been run at full output for over 24 hours, with no sign of

FIG. 1: 6A (to 20A) DC Regulator.

(a) For LM317
- **R7 4.7k lin carbon pot.**
- **R8 220 ½W carbon.**
- ***C2 1 uF tantalum.**

(b) For LM 340-12 to produce 13.8V output
- **R7 150 ½W carbon. SOT.**
- **R8 1.8k ½W carbon. May need adjustment.**
- ***C2 0.1 polyester.**

POSITIVE FIXED

TO-220	uA78XXCP	
	LM340T-XX	Pin 1 Input
TO-3	uA78XXKC	Pin 2 Output
	LM340K-XX	Pin 3 Common

POSITIVE ADJUSTABLE

TO-220	LM317T	Pin 1 Adjustment
TO-3	LM37K	Pin 2 Input
		Pin 3 Output

NEGATIVE FIXED

TO-220	uA79XXCP	
	LM320T-XX	Pin 1 Common
TO-3	uA79XXKC	Pin 2 Output
	LM320K-XX	Pin 3 Input

TIP32
- **Pin 1 Base**
- **Pin 2 Emitter**
- **Pin 3 Collector**

stress. Test results are given later, together with additional circuitry "options".

CURRENT LIMITING, or foldback protection was considered not necessary, for most amateur applications and was rejected for the sake of simplicity. The most common application for this regulator design will be for mains operation of mobile equipment. Most such gear is desiged for use on automotive battery supplies. Protection in such installations is limited to an in-line fuse.

In this circuit, over-current protection is by fuse. Plenty of circuits are available where more sophisticated protection is warranted.

FUSE (FS1) ratings need some mention. Fast-blow cartridge types should be used, though it should be noted that they are capable of carrying currents up to 25 per cent greater than their marked values and for considerable time. For example, several 7.5 amp fuses tested, passed 10 amps for over two hours, but at 10.5 amps such fuses failed after between ten and twenty seconds.

So where precise current protection is required, it can be achieved by selection of fuse values about 25 per cent less than the current level desired.

However, when fuses are used in this manner they run decidely hot and under mechanical stress, thus their useful life is very limited, especially if the current is repeatedly switched on and off.

For continous operation the marked value of the fuse should be as specified by the transceiver manufacturer.

OUTPUT VOLTAGE. Three terminal 1 amp regulators are available in a wide range of output voltages, any of which may be used. The Fairchild uA78CB is a long awaited addition to the range and provides 13.8V ± 5 per cent, in either TO-3 or TO-220 (plastic) packages.

The same voltage may alternatively be obtained using a 12V output device, with the common terminal lifted a couple of volts, as shown in Fig. 2(b), without degrading the regulation significantly. This method enables the voltage to be set precisely and may be preferable when exactly 13.8 or any other voltage is required.

If a variable voltage is wanted, the LM317 regulator is used with the circuit additions shown in Fig. 2(a).

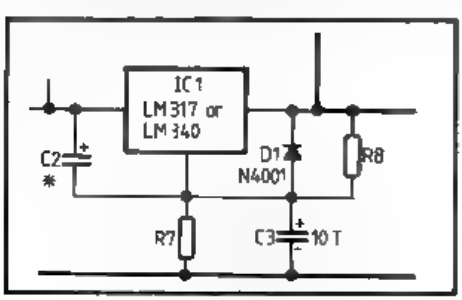


FIG. 2: IC Options.

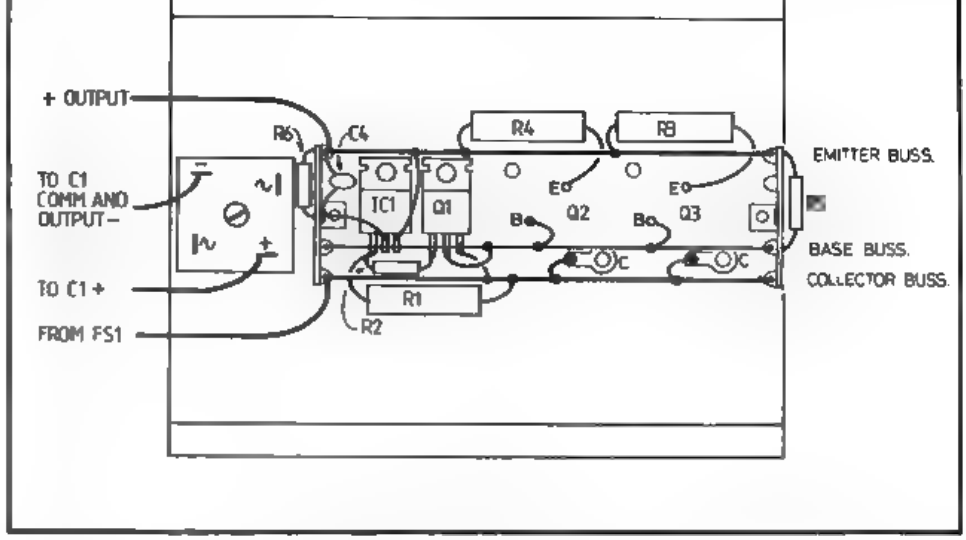


FIGURE 5: 6 amp Regulator Layout.

INPUT VOLTAGE, measured across C1, is determined by the transformer used. This voltage must be kept below the Absolute Maximum specified for the particular regulator used. For the LM340/LM78XX series up to 18 volts output, the maximum is 35 volts and for the LM340-24/LM7824 it is 40 volts.

This rating is given in a different form for the LM317 variable regulator, where the maximum difference between input and output voltages is specified at 40 volts, which means, for the device adjusted to give minimum output (1.2V) the input voltage must be kept below 41 volts.

For the 13.8 volt circuits described, the lower input voltage limit for good regulation is 17 volts for 6 amps and 20 volts for 20 amps.

SEMI-CONDUCTOR CONNECTIONS are illustrated in Fig. 4. It should be noted that even though the LM340 and LM317 are both positive devices, their connections differ. (Negative regulators are different again.) This circuit may be adapted for negative voltages by making the necessary polarity inversions.

The LM340 can be bolted directly on to the heatsink but the LM317 needs to be insulated with a mica washer as does the TIP32.

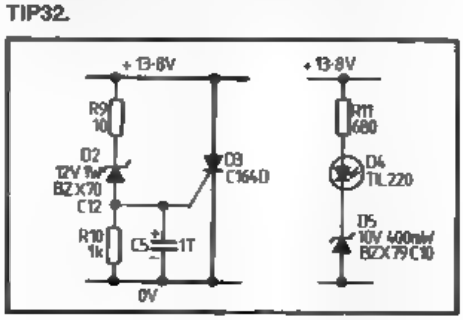


FIG. 3: Crowbar and Indicator Circuit.

Plastic TO-220 devices were used because they are much cheaper and require only one mounting hole, but there is no other reason why TO-3 packages should not be used.

BRIDGE RECTIFIERS churn out considerable heat so require thought regarding heatsinking. The case temperature of a PB60, without a heatsink, runs at the limit at 6 amps, but with 1½ inches of 4 inch width heatsink it is quite happy. The same type, on a near infinite sink self-destructs at between 15 and 20 amps continuous.

For the 20 amp regulator a type MDA3501 bridge on 3 inches of heatsink is adequate; these are rated at 35 amps and can cope with 20 amps joyfully and, incidentally, can be obtained at less cost.

FILTER CAPACITOR C1, 12000 uF was used with the 6 amp version. This value is somewhat higher than usual, probably because the transformer specified is being stretched. For 20 amps 2400 uF is suitable.

Increasing the value has no signficant effect on the output regulation; however it will reduce the ripple voltage amplitude. In some cases a worse ripple may be tolerated, so it is worth trying reduced capacity, down to half the recommended value, in order to cut costs. Capacity can always be added until the ripple becomes acceptable.

TRANSFORMERS are the most expensive consideration. The type M2000, obtained

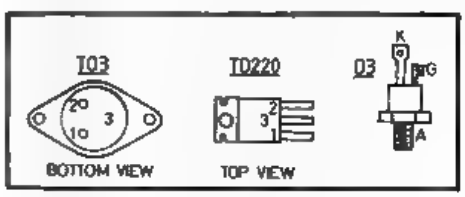


FIG. 4: Semiconductor Connections.

from Dick Smith, is used in the 6 amp version, at a quite good price. Though the regulator itself is capable of continuous operation, this transformer will only provide a continuous 6 amps for limited periods, and will be satisfactory at this current for the usual FM transmit-receive duty cycle. Run at 5 amps for longer than one hour the transformer becomes too hot to be picked up with bare fingers.

Alternatively Ferguson Transformers have type PF3788 rated at 15 volts, 8 amps, at a few dollars more. It has not been tested by the writer so it is not known whether the rating is continuous or peak.

Douglas Transformers, who advertise in ETI, have a range of up to 15 volts at 10 amps continuous, however transformers rated higher than that are not usually stock items. A single 20 amp unit can be made for some $40, so a bulk order from a club or group would be worth while. Even so a 20 amp supply can be made at a good saving over a commercial brick. If one has the facilities, a home spun transformer would be ideal.

CONSTRUCTION. A suitable layout is given in Fig. 5, for a 6 amp unit, all components are mounted on a 6 inch hunk of heatsink. At maximum ratings, 2 inches of heatsink should be allowed for each 2N3055. The integrated circuit and the TIP32 do not create much warmth. It may be more convenient to mount the components on the assembly box, but choice is up to the constructor.

In any case the load-bearing wiring, shown in heavy line on the diagrams, must be kept as short as possible and must be of sufficient cross sectional area to carry the peak currents.

The emitter and collector busses each consist of two lengths of 14 B & S tinned copper wires in parallel, supported by tag strips. Where multiple heatsinks are used, the busses can be paralleled with flexible wire of suitable size. The base bus is a single 14 B & S.

The transformer secondary wiring should be kept short too. The heavy current path in the negative (0V) line, is from rectifier to C1 negative terminal and to the output. There is no need for heavy duty wiring to the common side of the regulator. The IC common terminal is connected with 14/0076 size wire to the rectifier negative post via the heatsink earth point as shown.

Often otherwise good regulation is degraded, even in commercial supplies, simply because wiring has been skimped. Instead of using a single heavy duty wire, with which neat solder connections are hard to make, the writer finds that several smaller wires run in parallel, giving the same total rating, produce a better looking job. Otherwise layout is not critical.

PERFORMANCE

Input and output voltages measured are listed over the range of load currents.

6A. Output ripple at 6 amps was 12 millivolts peak to peak or 0.03 per cent. Regulation at the same current is 0.22 per cent. Variation of the main supply voltage by ± 6 per cent has no noticeable effect.

Load Current	V in	V out
amps	volts	volts
0	25.4	13.80
0.5	23.8	13.80
1.0	23.0	13.80
2.0	21.9	13.80
3.0	21.0	13.79
4.0	20.2	13.79
5.0	19.5	13.78
6.0	18.7	13.77

These results were obtained with a M2000 transformer.

With V in equal to 18 volt, 9 amps can be drawn loading the output to 12.0 volts. Of course this is impossible with the M2000. Results using an LM340-12 as in Fig. 2(b) were virtually identical.

20A. Output ripple at 20 amps was 40 millivolts peak to peak or 0.1 per cent. Regulation is 0.72 per cent and again ± 6 per cent change in mains voltage had no measurable effect.

Load Current	V in	V out
amps	volts	volts
0	35.0	13.80
2.0	32.8	13.79
4.0	31.5	13.79
6.0	30.5	13.77
8.0	30.0	13.76
10.0	29.3	13.75
12.0	27.8	13.74
14.0	26.5	13.73
16.0	25.8	13.72
18.0	25.3	13.71
20.0	24.8	13.70

With V in equal to 20 volts, the output is loaded down to 12.0 volts at a current of 29 amps.

These results should be more than adequate for most requirements. Ripple can be further reduced as stated earlier but this action should not be needed.

OPTIONS. Additional circuitry is detailed in Fig. 3. In all similar regulators, there exists the possibility of breakdown in the series control transistors. In such a situation the full value of V in can appear across the output terminals, with expensive results in the equipment being supplied.

THE OVERVOLTAGE CROWBAR in Figure 3(a) is suitable for an 8 amp or less regulator. With the component values shown, voltages exceeding about 15 volts will cause the SCR to fire, placing a very low impedance across the output, thus reducing the output voltage to zero and pulling a hefty enough current through the fuse to take it out very quickly.

The same circuit can be used with higher rated regulators, using suitably proportioned SCRs.

The efficiency of such crowbars is dependent upon very low wiring resistance, so the wiring shown in heavy line should be up to the job.

When other SCR types are used, component values may need to be changed to give the right firing voltage and of course the circuit can be adapted for any fixed output voltage.

R6 should be omitted if a crowbar is installed.

THE UNDERVOLTAGE INDICATOR in Fig. 3(b) gives an indication that the output voltage is at or below a minimum level. With the values given, the LED will glow just perceptibly at 12.5 volts and will be dark at 12.0 volts. At full output the LET will be bright.

R11 or the zener diode, which has a voltage tolerance, may have to be selected to give the required results.

CURRENT METERING. Most designs published in amateur magazines have one failing, in that when a current meter is included, it is usually badly positioned, after the regulator in the output leg. This has the result of degrading the regulation. At 5 amps, the internal resistance of the meter will cause a voltage drop in the order of about half a volt.

The regulation of our 6 amp unit, at full output, works out at 0.22 per cent, but with the drop across the current meter, the regulation is degraded to about 4 per cent.

If a current meter is required, it would be better placed between the fuse and the regulator, where it would not affect the regulation. The meter would carry the quiescent current of the regulator and any additional circuitry, but even as much as 50 milliamps would barely register on a meter of higher than 2 amps full scale deflection.

COMPONENT SOURCES of the heavy components have been mentioned in the text already. All semi-conductors may be obtained from Silicon Valley, the outlet of Cema Electronics. Miniature 5 way tag strips and heatsinks from Davred Electronics. The 0.2 ohm 5 watt wire-wound resistors, type ASW5, are obtainable from Radio Parts, George Brown, etc.

At the time of writing this design still represents the lowest cost for high current applications. In a year or so the prices of integrated and hybrid regulators may come down sufficiently to allow an "even more simple regulator project". ■

Technical Articles Always Needed

REPLACING THAT UNUSUAL 'JA' TRANSISTOR

— Amplifier Modification for the Kyokuto 2m Transceiver

Ian Hunt VK5QX
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Following fixing of the DC supply which had apparently suffered from a mains "bump" whilst left running in the shack I was able to check out the transceiver. Result! No. RF output. They don't like having about 30 volts DC fed to them at all. It did not take long to ascertain that the RF transistors in the Power Booster Unit had blown up.

I am about to fit a crowbar protection circuit to the output of my 12 volt 10 amp regulated power supply. On two occasions, having left the supply plugged in with the mains turned on, I have connected my Kyokuto transceiver to the output only to find the "S" meter dial shining much too brightly. The first time I was lucky and the regulators in the transceiver must have worked overtime protecting the circuitry, however, on the second occasion I stupidly pressed the transmit switch before turning off

So what to do? According to the circuit the unit uses a type 2SC1169 as the driver transistor, however the device actually in the unit was marked 2CS1965. The output transistor was a 2SC1605A. None of these types were immediately available as replacements, particularly for the driver transistor which is housed in a TO37 case with the emitter connected to the case. The case of this transistor is screwed to the underneath side of the amplifier unit chassis for heat sink purposes.

Replacement of the final transistor was fairly simple as the set already used a stud device in this position. Here a type 2N6082 (25 watt, 6.2 dB minimum gain device) was pressed into service. Fitting of this transistor did not present very much of a problem and was achieved simply by cutting short the wings of the transistor, which is designed for stripline use. The associated components were soldered directly on to the short length of wing left for the base and collector connections and the two reduced length emitter wings bent down and soldered directly to the printed circuit board on either side of the transistor

The physical nature of the original driver transistor is, however, such that direct replacement appears to be a little difficult to obtain. The problem can be overcome by the following method based on a suggestion by Steve VK5ZSD, who actually carried out the work in my shack involved in the first replacement, with yours truly looking over his shoulder urging him on.

A sort through the spare transistor drawer brought to light a Motorola type 2N5641 (7 watt, 8.4 dB) which was also designed for stripline type construction and had narrow leads for connection. Removal of the original driver transistor is relatively easy. The two holding screws underneath the chassis are taken out and the collector and emitter leads are unsoldered from the pads on the printed circuit board together with the leads from other associated components. The aid of a solder-sucker is invaluable here. Do not be fooled by the appearance of this driver transistor because as well as the emitter connection being via the case clamped to earth, there is a third lead from the transistor soldered on to the board and initially a little hard to see.

Incidentally, it is a simple matter, the removal of four screws and unsoldering of two light coaxial cables and two other wires, to completely remove the entire amplifier chassis from the transceiver, which makes it much easier to work on.

To replace the driver transistor with a more readily available type the following procedure was necessary.

First of all the small tinplate shield across the amplifier compartment had to be removed. The use of a short length of coaxial cable braid wet with liquid flux, in the absence of "solder-wick", to soak up the holding blobs of solder while heated with the iron allowed this feat to be performed without too much trouble.

A hole to allow passing the stud of the replacement transistor was then drilled through the chassis and a large drill used to cut away the printed circuit board to permit the replacement transistor to fit down snugly on the board. Again, cutting back the leads of the replacement and a similar connection scheme as for the final transistor allowed a neat job to be performed. The pads on the printed circuit board for base and collector connection for each transistor were not used as the transistor wings are sufficiently stiff to act in a self-supporting fashion and allow direct connection and easier soldering of the components. The cut-out in the tinplate shield to be replaced in the compartment was slightly enlarged so that the shield would clear the head of the replacement transistor and was then soldered back into place with little difficulty and not too much solder to allow easier removal later, which approach proved fortuitous in the light of further happenings.

Then came the matter of tuning up the unit following the replacement of one of the transceiver power supply unit transistors which had also suffered. Fortunately a general purpose replacement type of sufficient rating can be used here if you have a problem in this section.

I might also comment that with "JA" type transistors it is quite common for the first two identification numbers or letters of the transistor type marking to be left off, e.g. 2SA495 marked as A495 or 2SC1605A marked as C1605A, so don't be fooled by this and think you have a peculiar transistor type number on your hands.

The first problem encountered when commencing tune up was the fact that the trimmer capacitor across the input (base) circuit of the driver transistor came to the fully meshed position for maximum RF output and would not actually peak. Experimentation proved that an additional 15 pF (approx.) was required across this trimmer, and a small disc ceramic soldered into place solved this problem. A check of Steve's (5ZSD) Kyokuto transceiver in original condition showed that just such a value had been fitted by the factory, so obviously these tuned circuits are not as precisely made as you may think.

It was then found that no amount of tuning up of the circuits in the RF amplifier plus a check and peaking up of

circuits on the exciter board would produce more than about 6 watts at the output. Some head scratching and puzzlement followed, as to all intents and purposes the new driver transistor should have performed the job very well

A little further thought and consultation of the data books showed that a much better transistor to use would be the Motorola Type 2N6080 (4 watt, 12 dB), which is designed as part of a set of transistors 2N6080 to 2N6084 specifically for the purpose of RF power build-up in circuits of this nature, the latter type (2N6084) being capable of about 60 watts output at these frequencies and used by me in an outboard power amplifier sometimes driven by the Kyokuto transceiver.

The process of replacing the driver transistor was undergone again with much less difficulty than before, probably due to the experience already gained

With this complement of transistors now in the amplifier a tune up produced almost 15 watts of RF output power, which was considered to be satisfactory. No problems were encountered with the tune up, which was done at 146.50 MHz, and the output remained constant over the band from 145 to 148 MHz, with a drop off in output at 144 MHz.

One other word of warning when working on this unit. When soldering in the amplifier compartment be careful not to let your soldering iron touch against the plastic bodied trimmer capacitors as they will melt very easily. It is probably better to remove them altogether and replace them later when rebuilding the stages if you are in any doubt as to the steadiness of your hand.

Now to summarise:

1. If you are using a regulated DC supply for your solid state transceiver without a suitable warning or voltage metering system on its output, don't leave it plugged into the mains and turned on so that mains surges can do damage and catch you napping. (In my case, twice.)
2. You would be well advised to fit a "crow-bar" over-voltage protection system on any such supply so as to protect your prized expensive transceiver.
3. The Kyokuto RF Power Amplifier stages can be satisfactorily replaced with more readily available and conventional stripline RF power transistors, and the job is not beyond the average amateur. This probably applies to some of the other popular transceivers as well.
4. Check the data books carefully when undertaking a project of this nature and choose the most suitable type devices for the job. It is not true that almost anything will do when replacing transistors, particularly in the area of RF devices. They are certainly not all much the same as one another.

I trust that this information has been of interest to you and that it may also be an encouragement for you to overcome a problem should you also, God forbid, be unlucky to have a similar blow up and not be sure whether or not you can do much about repairing the gear.

I would also like to acknowledge the encouragement and assistance I received from Steve Dench VK5ZSD in getting my unserviceable unit into operating condition again. ■

CW AND REDUNDANCY

Dick Goslin VK3SV

In recent years, opposition has been expressed to the retention of CW in the examination syllabus on the grounds that it is "old-fashioned". But it is still the most reliable method of radio communication, and under difficult conditions may be the only one available to us. We are officially recognised as the amateur SERVICE, which implies an obligation to provide communication by the most effective means. We should therefore try to improve our skills rather than reject one of them simply because it happens to be the oldest.

This article follows an earlier one (December 1977) which dealt with the use of abbreviations. Other means of obtaining a "speed-up" are available to us, one of the more significant being the elimination of unnecessary (redundant) words. The English language contains many words which, although desirable for grammatical reasons, may be left out without reducing the sense of the message. For instance, we ask "Where is the house?". A Russian would ask "Where house?". The question is still clear and understood, but the reduction in words is 50 per cent and in elapsed (transmitting) time 33 per cent. (10 morse characters in place of 15.)

As such a simple example may not be a reliable guide to redundancy, suppose we look at an extract from a daily newspaper. I have chosen a newspaper report because in general terms these are probably closer to our usual way of expression than other forms of printed matter. "It appears that a ladder left in the recreation area was used by the prisoners to climb over the bakehouse roof and make their way to a car waiting for them in an adjacent street." The passage contains 144 letters or morse characters. At 10 w.p.m., or to be precise, 50 characters per minute as per paragraph 15 of the Handbook, it would take 2 minutes 53 seconds to transmit.

If the redundant words are removed, being careful to retain the sense of the message, the passage is reduced to — "Appears that ladder left in recreation area used by prisoners to climb over bakehouse roof make way to car waiting in adjacent street", a total of 111 characters, which at 10 w.p.m. would require 2 minutes 13 seconds to transmit. So whilst maintaining a keying speed of 10 w.p.m. we have improved our *rate of communication* to the equivalent of 13 w.p.m. I have not mentioned abbreviations as these can be learned by reference to journals or by listening around the bands. Their use will further increase the communicating rate.

The application of redundancy comes only with experience and practice, as with most other forms of skill whether mental or manipulative. A starting point could be the writing down of a sentence which you expect to use on air, and then striking out any word not necessary for the message to be understood. "(My) name is Bert (es) QTH (is) Hobart OG (on) ur rig wx (hr) (is) cold windy raining." He knows you are describing *your* weather, not his. The benefit may seem marginal but over a five or ten minute transmission (with call signs repeated at the required intervals) can be quite substantial. For those interested in examining the transmission from "Bert", the reduction in sending time is 22 per cent.

In time, the practice of eliminating unnecessary words becomes so automatic as to require no conscious effort. Instead, the operator's mind may be several words ahead of his keying, "dropping" those that are not essential, substituting short ones for long ones, and transposing others to avoid the use of prepositions.

A final note on use of call signs. Having established a QS contact, restrict subsequent identification to his call sign sent once, followed by yours sent once. He expects you to call and is listening to you. Repeating call signs wastes his time as well as yours.

I am indebted to Don VK3AKN for many valuable comments on "redundancy". ■

NEW DEVELOPMENTS FOR THE MORSE ENTHUSIAST

Geoff Thompson VK3AC

Not a great deal has yet been heard here about some ham equipment which now sets new standards, particularly for the CW-morse enthusiast.

Full break-in has always been the goal for the ardent "smoke signaller", but it has been something which has been completely ignored by most of the manufacturers of ham gear. In fact, even with some of the most expensive transceivers, fiddling with key filters to eliminate clicks and thumps and to improve keying shape has been almost mandatory.

In 1968, the American Electrovoice Company merged with a conglomerate. The company will be well remembered by professionals for its high quality microphones. I have used them in sound film production for many years.

Albert Kahn K4FW was President of Electrovoice at the time of the takeover and he resigned to form a company of his own. On a ten acre block he and his associates built a modern factory complete with tool and die shop, plastic moulding facilities, turning and fitting workshop and provision for the production of components, including power and audio transformers, etc., forming the basis for the production of a little three watt QRP three band transceiver designed to interest youngsters in radio communication. However the greatest sales were to oldtimers who became interested in the idea of QRP after having inhabited "kilowatt alley".

Out of this little rig, of which 4000 units were sold, grew the Argonaut, a small five band CW-SSB transceiver which could be powered by a lantern battery.

PHOTO 1: The VK2BF Morse Keyboard.

Then came the Triton which was the forerunner of the totally solid state medium power transceiver, a system which has since been widely imitated.

Albert Kahn and his boys have now produced the Century 21, a 70 watt CW transmitter-receiver which has the full break-in facility and optimum keying characteristics. This little box containing its own power supply is an ideal unit for the ham who is interested exclusively in CW-morse.

Now have come the Omni series of SSB-CW solid state transceivers complete again with full QSK at speeds up to and exceeding 50 words per minute. With his background in the audio business and his hobby interest in ham radio, Albert Kahn has combined these skills to produce the Ten Tec range of ham gear which has set new standards for SSB audio quality and dynamic range and for perfect morse keying characteristics without external filters being required.

Having had the opportunity to use both the Century 21 and the Omni D rigs on the air for some months, I have enjoyed the experience of full break-in. Previously it had required several relays and a relay

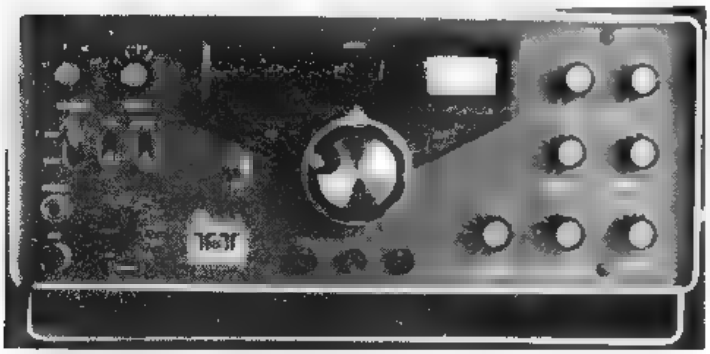

PHOTO 3: The Omni D Ten Tec.

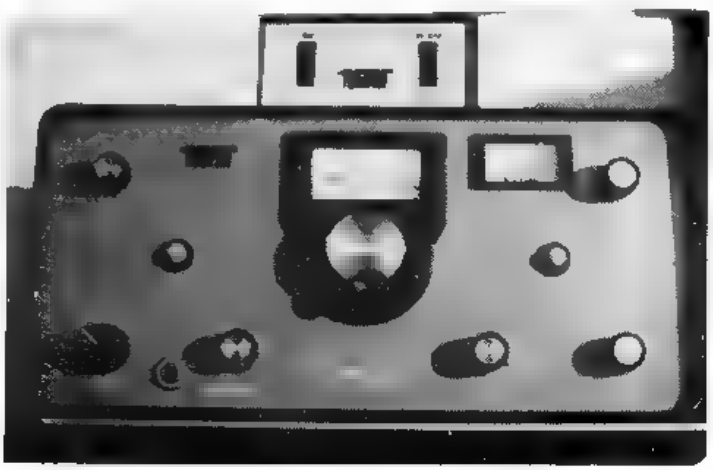

PHOTO 2: The Ten Tec Century 21.

control system to achieve full break-in using a transmitter and a separate receiver This was an unreliable system when using a keyboard at speeds up to 55 words per minute. So it was a real pleasure to have TR switching which would permit high speed sending which could be broken by a single dash from the station at the other end When two hams are using this gear the full break-in feature is at its best and short overs add a new dimension to a QSO using CW-morse. Most of the transceivers today provide limited break-in using the VOX relay. The slow make time of this relay in many cases spoils the first character each time the relay closes.

The Ten Tec rigs are particularly amenable to the morse keyboard and will key cleanly up to 100 words per minute. On the CRO, the keying shape is identical with the CRO photograph of the optimum attack and decay times published in the ARRL handbook. A 12 volt storage battery floating acros a ten amp charger provides an effective power supply for the Omni series of rigs.

Graham Stallard VK5ES is Albert Kahn's representative in Australia. Graham has full facilities for a back-up service, including any modifications which may come to hand for Ten Tec gear.

Allan Appleby VK2BF also has an Omni D and will be happy to demonstrate to VK2s at his Dural QTH. Allan has led the VK interest in morse keyboard communication, and his latest design puts his keyboard well ahead in this field of communication. Allan's keyboard embodies a number of features, including a recirculating memory system which can be very useful. The keyboard has a digital readout indicating the number of characters in the buffer at any instant. The capacity of the buffer is 64 characters, but a warning LED lights up at 60 characters, giving time to slow down and avoid over-filling the memory.

To read morse at 50 w.p.m. plus, it is essential that the "weight" should be optimum. Too heavy and copy can become very difficult. It also becomes unpleasant if the weight is too light, so there is a dot length and dot-dash spacing which is just right for the speed being used and for clear cut copy of QRQ morse. So with the full QSK facility and one of Allan's keyboards, morse isn't as old-fashioned as many hams might think. With the Americans hitting speeds of 80 words per minute plus, we still have some way to go to match that sort of performance. But even if we don't, it's still a new ball game and a very interesting one because it becomes a new language when reading high speed morse in the head Who was the American General who said "When the balloon goes up, the frequency spectrum will be so full of signals and counter signals that it could be the little guy with the morse key who will get the message through" —hi. ■

ELECTRONICS — ITS PART IN MY DOWNFALL

John Tuppen VK6XJ

Be patient, dear reader, as my tale could be long in the telling. Settle down, turn off the gear, lock the kids out.

My father was an ex-military man of English extraction, just old enough to play a very small part in the first big bunfight, and just young enough to play a larger part in the second.

In the interim, he had come to Western Australia and tried his luck on the land, but due to sundry catastrophies, not least of which were the results of the Wall Street crash, I think everyone was relieved when the British requested his presence to assist with the troublesome little German painter.

Yes, we will get round to wireless in a moment.

Father had just a little spare time in the initial stages of this business and took himself a wife, which explains why, during some difference of opinion my father was having with a chap called Rommel, he received a communication telling him of my arrival, and that I bore an uncanny resemblance to him. It is said he spent quite some time searching for a mirror in order to see what misfortune had befallen him.

In 1949, father having concluded his business in Europe, we all emigrated to WA, where he was this time most determined to succeed in obtaining his own farm.

"It's not going to be easy," said father. He was not wrong.

Yes, yes — Wireless!

It was during the early 1950s. We were living on a rather isolated wheatbelt farm, at the time resident, together with the property's original owner (an elderly Irishman), in an old unlined Nissen hut, aptly called the Igloo in winter and something quite different during summer. I had very little in the way of toys, and the old Irishman, feeling sorry for me, cast about among his possessions and discovered a very old, completely defunct Batyphone receiver. "Here lad," he said. "Pull 'er ter bits an' see if yer can get 'er goin' agen."

What joy! Never had anyone given me anything like that before. Carefully I separated its various parts. What peculiar secrets could they hold? Even more carefully (I had nothing else to do) I separated the parts of its various parts. Resistors were broken in half to see what discoveries I could make therein. Paper condensers were disassembled and their yards of tinfoil and wax paper studied most intensely. What hidden mysteries could it all contain?

I couldn't wait to get to school next day, and having done so, went to the meagre collection of books, they had there (it couldn't be called a library) and, glory be, a textbook on wireless. It was dated 1930, did not look as if it had ever been read, and I'm blowed if I can remember its title. There amongst the bright emitters, dull emitters and variometers (hands up all those who knew what a variometer is), was all the information I required. Quickly I requested that I borrow it for a while. The teacher was puzzled why a 10-year-old should request such a thing, but conceded.

I read it from cover to cover. Numerous times. Most of it meant nothing to me but by then I was hooked. I contracted the disease then, from which I have never fully recovered

I found from my perusals that, with the remnants of Batyphone, a telephone earpiece from an old wall type phone which had fallen into my possession and a thing called a cat's whisker, I could build a crystal set. But where could I get a cat's whisker? I gathered up my meagre savings, which amounted to 2/6d. and during school lunch hour, went into the local radio serviceman whose name was Vic Trobe. (Are you still out there somewhere, Vic?) I demanded a cat's whisker. Vic smiled, went to his bench and returned with a point contact germanium diode. "It's the very latest thing, much better than a cat's whisker," he said. "It's 2/6d."

Home became a hive of activity I erected a "long and well elevated" length of fencing wire, bashed in an earth stake, wound my first coil, and with sundry bits of Batyphone, suddenly found myself listening to 6MD, the local broadcasting station.

The old Irishman came in about that time and saw my contrivance He smiled. Turning to Mum he said, "By God Missus,

yer'd think 'e knowed what 'e was doing with all them bits". He turned to me. "Well, yer got 'er goin' yet lad?"

"Yes, it's working now, Mr. Dwyer," I said. "Would you like to listen to the news?"

Determined to humour this small boy, the old man gravely placed the receiver to his ear, listened briefly, turned a ghastly shade of pale, then staggered to his room for the comfort of a bottle of old Irish he kept secreted there for such occasions.

Time passed and, flushed with my success with the crystal set, I progressed on to greater things. We had moved out of the Nissen hut into something slightly more resembling a house and I soon had a new wire antenna up.

Further reading of my book showed the way towards regenerative receivers, and I found I had in my possession (doubtless from the Batyphone) a type 30 triode, which became the heart of my first such receiver.

I soon found that there were other places in the spectrum than the broadcast band, and one memorable night I discovered some people talking on a band they called 80 metres. It was AM of course, and there was little activity, so I had no trouble hearing them.

To me, they were gods, discussing so blithely such exotic things as dipoles, 807s, high level plate modulation and a host of sundries too numerous to mention.

I swore then, there in the dark, illuminated only by the soft glow of the type 30 filament (we had no electric light), a solemn oath that one day I, too, would join their ranks and speak so knowledgeably about such things.

Time moved on. I constructed a miniature broadcast receiver in a two ounce tobacco tin using a 1T4 valve (the A and B batteries I carried in my school satchel) and gained many points with the girls in my class — until someone's incredibly rich dad returned from Japan with the latest pocket sized transistor radio. I took an instant dislike to semi-conductors.

When I was 14, it was decided that I was having trouble holding down two jobs (school and farm work), and anyway it was a well known fact that too much learning was not good for you. There was concern that I was not doing myself any good, what with all this wireless business and all. (There had been some trouble about oscillations getting into father's wireless while he was listening to weather reports.) Thus it was decided I join the workforce as a farm labourer.

By the time I was 15, I had built a 6 valve superhet receiver, resplendent with BFO, using 2 volt filament tubes, and by scrounging around various rubbish heaps I could generally pick up enough discarded B batteries to hook up in series and enable me to listen to Wally Coxon VK6AG, putting on the Sunday morning WIA news. If I was particularly lucky the batteries would hold out long enough to hear a bit on 80 during the week.

Around this time father, being a kindly man, decided that the age of the kerosene lamp was about done, and one memorable day arrived home with a 32 volt generating plant and lots of wire, fittings and batteries.

"You know about such things," he said. "You'd better wire up the house and get 'er going. Make sure you're finished tomorrow night so you can get on with farm work next day though."

Never has a house been so carefully wired. Every joint spliced and soldered. Every cable insulated from its mate in exemplary fashion. But we had power the next night, and I was already planning a vibrator HT supply . . .

One day father had roasted me for "fiddling with that damn wireless", and gave me a list of instructions to be carried out whilst he made his weekly visit to town. He went into the bathroom to shave off a seven day growth with his newly acquired 32 volt electric razor and, seizing the opportunity, I went out to the engine room. Estimating the best possible moment, I pulled the fuses out of the board. I am told it took father quite some time to remove the jammed cutters from his face, but can't verify this fact as I was by then heading for elsewhere at a fair rate of knots.

I have never known my father to use an electric razor from that day to this.

I could go on with anecdotes regarding the older farmers and their electrical misadventures for some time, but, dear reader, the story is long enough now. I will content myself with observing that I am sure Dad and Dave lived round here somewhere — they just took on different names and faces at times.

During the next few years the disease really took told, and my exploits in electronics continued. I discovered that there were two amateurs living in our local town (Merredin) at the time, and one day nervously knocked on the door of the local broadcasting station, which was opened by a large man I came to know as Mal Urquhart (VK6MU). Mal taught me many things about radio transmission and though he has long joined the silent keys, I remember his teachings well. I also met Bob Elkin (VK6RE), the other amateur in town, and he also was most helpful, particularly on the operating side of amateur radio. Bob is now in Sydney, his call is VK2ASH.

I obtained a commercially built receiver. Having acquired the sum of £15, I went to see Jack Burrows (VK6BU), who was running a small business in Perth at the time, and boldly telling him of my vast hoard, requested his advice on the purchase of a receiver. To Jack's credit, he neither laughed nor kicked me out — he went out the back and returned with a thing I later learned was a 3BZ. It remained with me for a long time and taught me a lot — particularly about replacing paper capacitors . . .

By 1962 I had a Marconi CR100 receiver, had constructed a modulator using a pair of 807s, and was fronting up at the local post office for the full AOCP examination.

Grimly I awaited the arrival of the buff envelope with the results. I knew it would be touch and go.

It arrived. Total devastation! I had failed by two miserable marks. Just 68 per cent in the theory. I was shattered. Next time, I swore, next time there will be no mistake. If I had known then that it was going to be 15 years before I again had the opportunity to sit at the examination table, the devastation would have been complete.

I was at this time equally determined to get established on my own farming property and this, together with other interests (well, I was a young healthy country boy), gradually drew me away from radio.

It was not until August 1977 that, in one of those quirks of fate that make truth stranger than fiction, I suddenly found myself in the shack of Mick Cole VK6TV.

I had achieved most of the aims I had set for myself years ago, I was master of my own land and doing well, was married with a family, and probably unconsciously casting around for a new challenge.

Mick showed me his gear. It didn't look much like the gear I remembered, but as he turned on the TS-820 I saw the digital display showing 14.250 and heard a K6 coming through at good strength. "Well, twenty metres is open to the west coast of W land," I said. Mick picked himself up off the floor and rightfully demanded, if I was so damn smart, why wasn't I doing something about it?

It was a good question. Mick told me about a new class of licence called the Novice, and said there was an examination due in a few weeks time. With the help of Mick I got my brain working along such lines again and in early November found myself in front of my own brand new TS-520S, with a brand new Novice call sign. It was so strange — very few of the calls I remembered were still around, the gear was so different and although many people spoke about 807s, very few (particularly the Novices) even knew what they looked like!

However, it was great and I enjoyed the few months of Novice operation while waiting for the next full call examination in February 1978, and this time (I was right!) there was no mistake, and the vow I made as a small boy so many years ago was at last completed.

When I first came up on air, a few operators asked me how I came to be interested in amateur radio. Was it via CB? Good grief!

Others asked which technical school I had attended in order to acquire such knowledge as required to pass the AOCP examination. I wish I could think of a name for it! But I wouldn't swap the experience for quids (well, perhaps not), and it's all been worth the effort.

There is still some concern in my mind though.

My youngest daughter, Ann, although she is only 14 months old, is even now taking an uncommonly unhealthy interest in all things electronic. Whenever any home brewing is being done she requests — nay, insist — most vocally to be sat in her high chair next to the work bench. Each resistor as it is inserted in the PCB is most carefully studied. Each capacitor scrutinized thoroughly.

Yer'd almost think she knowed wot she was doing with all them bits.

Remind me to go back to the old safety razor in a few years time. ■

SOME IMPROVEMENTS TO THE EDDYSTONE 888A RECEIVER

A. G. Loveday VK4ZBI
Aviemore, Rubyvale 4702

Here is an article for the owners of old receivers.

These fine receivers of the 1950s were much sought after until the transistorised transceivers became common. The writer recently purchased one and although it was found to be excellent for AM signals it left much to be desired on SSB.

The results of considerable investigations are described here. Firstly it was decided to stick with valves. All the old 0.1 uF capacitors were replaced. A product detector, Fig. 1, was added. This is a circuit devised by W6SAI and shown in the Radio Handbook, but now has an audio amplifier stage added. An audio derived AGC circuit, Fig. 2, was included. I also disposed of the 6AL5 noise limiter/S meter blocking diode.

Next the audio filter was replaced by one with switched bandwidths from 60 to 3,500 Hz. A uA741 IC was used; this circuit is on page 113 of the 5th Edition of the RSGB Amateur Radio Techniques. The power supply was relocated on a separate chassis to reduce drift.

I now have a fine receiver which is more sensitive than before, especially on 15 and 10m. ■

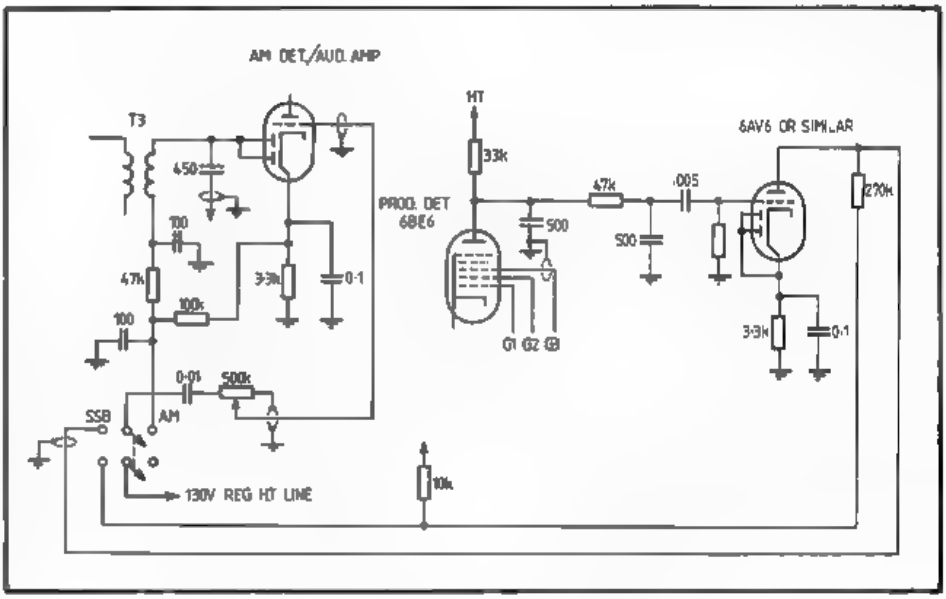

FIGURE 1: The new Detector Circuit.

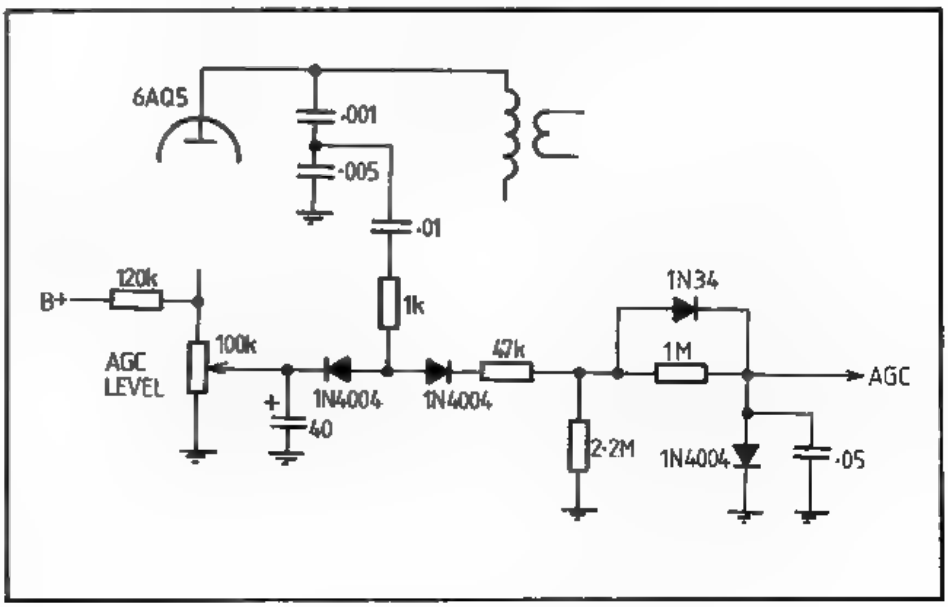

FIGURE 2: The new AGC Circuit.

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Join a New Member

AMATEUR RADIO SATELLITES: AN OPPORTUNITY FOR EDUCATION

Stephen C. Place WB1EYI,
ARRL OSCAR Education Programme Manager
AMSAT Phase III Education Special Service Channel Co-ordinator
Submitted by Bob Arnold VK3ZBB

With AMSAT-OSCARs 7 and 8 and the Soviet's recent RS-1 and RS-2 Amateur Radio Communications Satellites, and with the upcoming AMSAT-Phase III-A long range, high elliptical orbit communications satellite, AMSAT-United Kingdom's University of Surrey scientific and educational UOSAT, and several other Amateur Radio space-bound projects still in their infancy, the future of the Amateur Radio satellite programme looks very bright indeed. Opportunities for a variety of applications in educational programmes throughout the world are greater than ever before as newer and more exciting programmes arise with every new launch. The following is a paper explaining the OSCAR Education Programme and how it can become an invaluable resource to the educational system and students.

The Amateur Radio Service has been well respected through the years for its service in the international community. Always probing, exploring, pushing the cutting edge of technology; always ready to assist in times of natural disaster and emergency when other lines of communication are out; always willing to educate the uninitiated in electronics technology and communications techniques. The opportunity for education which may be considered among the more valuable contributions of Amateur Radio, is often overshadowed by news of floods, fires, and earthquakes which stir the emotions, and developments in slow scan television and narrow band voice modulation that excite the imagination. Nonetheless, today's young men and women aspire to careers in space communications technology, or those who wish only to prepare themselves better to prosper in the technological age now upon us, can do no better than to become involved in our Amateur Radio hobby

One of the areas holding great promise for our students is the OSCAR Education Programme. Our OSCAR satellites offer the student a chance to actively participate in his studies of space science and communications: a chance he most likely would not otherwise have. This programme in its many variations has served countless thousands in recent years, from very young students to college and university classes, from well equipped science centres to poorly equipped inner city school systems and from classes in North America and Europe to the Far East and Africa. Today we are on the threshold of an even more exciting future We strongly urge you to investigate the possibilities: for your hobby, your country's students and your enjoyment.

AMATEUR RADIO SATELLITES

Why have amateurs become involved in the satellite field? Ever seeking more reliable and effective ways to communicate with one another, amateurs have utilized state-of-the-art technology in expanding the usefulness of their frequency allocations. High frequencies (HF), though their reliability has been enhanced over the years through technological development, are still subject to the vagaries of propagation. The large segments of very high and ultra high frequencies (VHF and UHF) to which amateurs have access do enable predictable, reliable communication, but only within slightly greater than line-of-sight ranges under normal conditions. Orbiting high above the earth, however, a satellite is simultaneously within the line of sight of many earth stations dispersed over a comparatively wide range. Equipped with a transponder (receive-retransmit unit), such a satelite would greatly extend the reliable communications range at VHF and UHF.

Our Amateur Radio satellites have done just that. Routine daily VHF communications up to 7500 km have become commonplace during the past five years. But amateurs have not been the sole beneficiaries of this effort. OSCAR users have demonstrated the practicality and effectiveness of using satellites for such innovative applications as locating downed aircraft quickly and accurately, remote store and forward data transmission, the transmission of electrocardiogram information in transit from the scene of an accident, and, of direct concern here, in teaching physics, space science and related subjects to students at all levels.

The OSCAR (Orbiting Satellite Carrying Amateur Radio) satellites we use today have evolved over the past twenty years. The OSCAR series was born in 1961 with the launch of OSCAR 1, only four years after Sputnik 1, the first man-made orbiting satellite of any kind, achieved orbit. The small battery-powered box built by the Project OSCAR group of radio amateur hobbyists in California represented the amateurs' first venture into the space age. Four satellites and several years later, the Radio Amateur Satellite Corporation, AMSAT, was formed in the Washington, DC, area to continue the work. Volunteers, many with absolutely no prior experience in the field, designed, built and secured launch opportunities for a very successful series of communications satellites. Though these have gained wide notoriety for having been built in garage and basement workshops by unpaid volunteers at absolutely minimum expense, the record has been nothing less than outstanding. Often exceeding their life expectancies by years, the spacecraft in the AMSAT-OSCAR series have been recognized for their reliability and quality. This and imaginative applications in scientific, educational and public service areas have led NASA to continue its generosity in providing "secondary payload" launch opportunities. AMSAT's record was recently exemplified in the launch of OSCAR 8. AMSAT's proposal was selected first by NASA from 80 world-wide applicants. And with the upcoming Phase III OSCAR, AMSAT's acceptance has spread: Phase III-A will be launched as a secondary payload by the European Space Agency

As the satellite programme has grown in sophistication from the early short-lived orbiting beacons to the present long-lived, multiple transponder communications vehicles, it has also grown in international involvement. AMSAT now has nine active affiliate national organizations, over thirty countries with official organizational representation, and satellite users in over 100 countries. Many countries, including Australia, Canada, the Federal Republic of Germany, Japan, the United Kingdom and the United States, have contributed to the design and construction of the AMSAT-OSCAR series and continue their involvement in several upcoming projects. An open invitation exists

to any country to become involved in the satellite programme, if not through technical contribution, then through operations participation. Countries that are now developing a base of technical expertise might consider using the satellites in gaining direct space technology experience for their students. Students in both Kenya and Sierra Leone are preparing to use the AMSAT Phase III-A satellite in their studies and we enthusiastically welcome others with a similar interest.

THE OSCAR EDUCATION PROGRAMME

Recognizing the potential of the OSCAR satellites in educational settings, the American Radio Relay League in conjunction with the Radio Amateur Satellite Corporation sponsors the OSCAR Education Programme. With OSCAR as the focus, students from a wide range of curriculum areas spanning many grade levels are introduced to modern space technology. What are the benefits of OSCAR Education? Active involvement, hand-on experience and personal participation, are all parts of this dynamic approach to learning. As their studies come to life, students will become more motivated and gain a familiarity, a comfortable rapport with space science that would not be theirs from traditional, passive study alone. The programme (a curriculum guide, suggestions and ideas for experimentation) is extremely versatile and may be adapted in any number of ways: from a closely structured and supervised course of study to a loosely structured approach that draws heavily on students' initiative. There is no charge for the programme and the only requirement is having access to a very modest ground receiving station to monitor the satellites' activity.

What will a class likely do with the OSCAR satellites? How will it begin? To use the satellites for any programme of study or experimentation, the students will have to understand its orbit, locate its position at any time and predict when it will be accessible to the class. Thus, the typical first step will be an introduction to *basic* orbital mechanics. For younger students, understanding a simple graphic tracking device using previously calculated orbit schedules may suffice. Such concepts as altitude, range, period and incremental progression will become familiar. A more demanding approach will have the students derive all of the orbital parameters through careful observation over time. Using the change in received frequency, resulting from the Doppler Effect, students will plot beacon frequency versus time, determine the times of closest approach over several consecutive orbits and derive other orbital parameters, Kepler's Laws, or even the mass of the earth. The key here, though, is involvement. The students will learn by interacting with their environment; their experience will teach them basic space science as they see the laws of nature at work. Refining their calculated parameters with further observation over time, the students will be able to predict with fair accuracy when the satellite will again be in range. What better test of success than actually to hear the satellite rise above the horizon at the appointed time? Such direct personal experience and immediate feedback are very strong teaching techniques.

Using OSCAR as a remote laboratory tool will similarly help in teaching radio electronics. Few if any elementary or secondary schools have orbital hardware at their disposal, nor do they have access to sophisticated electronic technology. OSCAR ground receiving stations need not be very complex; construction of a ten metre receiver and two metre receive converter are projects well within the grasp of many secondary school classes. Regardless of the receiver used, however, constructing antennas of various types and subsequently comparing their effectiveness, are inexpensive tasks that can easily involve entire classes. With these simple devices the students will gain the access to sophisticated technology they would not otherwise have had.

The opportunity for students to participate in meaningful scientific experimentation is constrained only by the imagination. Routine "experiments" such as determining whether the satellites are in sunlight or darkness, electronically measuring the slant range to the satellite and observing how it changes throughout the orbit, calculating the seasonal effects on the satellite's temperature and voltage, calculating satellite spin rates or even observing the patterns of performance degradation over the lifetime of the satellite will give students an inside view of space science and satellite communication. And students may make a real contribution through propagation studies; it was through an amateur radio satellite that anomalous or inverted Doppler was noticed. Furthermore, utilizing the Morse encoded telemetry that is transmitted on OSCAR's beam, students will gain a personal insight into the concept of integrated systems and interdependent units. Students test their world for the answers, again learning through experience.

FUTURE OPPORTUNITIES

We feel that the OSCAR Education Programme has much to offer progressive school systems today, and the thousands of students who have learned with OSCAR agree. But we have barely scratched the surface. Some inner city schools such as those in Camden, New Jersey, are using OSCAR to acquaint their students with space science in preparation for an experiment that will ride aboard one of the first NASA Space Shuttle missions. A special programme in Newark, New Jersey, uses OSCAR as a motivation technique for their under-achieving students, while Talcott Mountain Science Center in Connecticut has used the programme as a supplementary experience in their academically talented students. Programmes similar to these are possible in your school system as well, and with the launch of Phase III early in 1980, the possibilities expand tremendously.

Phase III will be launched into a high elliptical orbit that will simultaneously cover most of the Northern Hemisphere at its apogee and extend access times up to ten continuous hours. Though the communications range and times of availability will be less in the Southern Hemisphere at first, after several years the apogee will precess to a point over the equator and the Southern Hemisphere will benefit from the long-duration, long-range use. With AMSAT-Phase III-A the OSCAR satellites will become as much tools for study as objects of study. Present plans are to incorporate a Special Service Channel scheduled for educational use only, while the telemetry beacons and the rest of the passband will still be available to the student with other specific needs. Also planned for launch in the next year or so is the University of Surrey's UOSAT, a satellite intended solely for educational use. It will carry beacons in several of the amateur frequency allocations to facilitate propagation studies, and will contain devices (cloud cover camera, magnetometer, etc.) to facilitate new experimentation. From low altitude, nearly circular orbit and high altitude elliptical orbit satellites to geostationary orbit amateur radio satellites, the possibilities are many and the future very bright indeed.

How may you get involved? AMSAT, all of its international affiliate organizations and the ARRL welcome your active involvement in the OSCAR Education Programme and pledge our assistance in whatever ways may be possible. We strongly suggest that you locate an interested person or group within your society to serve as Education Programme Co-ordinator for your country. He would serve as liaison to AMSAT's and ARRL's Education Programme Co-ordinator and would be responsible for co-ordinating local efforts. He would be the contact for us as well, and would receive information on upcoming programmes, and, in turn, be the source of information to Radio Amateurs and educators in your country. Meanwhile, please let us know your needs and desires so that we may better plan for the educational use of AMSAT-Phase III-A. We urgently request your ideas and suggestions as well as those of interested educators. OSCAR satellites are truly an international co-operative effort, and we want the educational benefits likewise to be world-wide.

Please share news of the OSCAR Education Programme with educators in your country and please convey our eagerness to serve them. The OSCAR satellites and education programme are here for *your* benefit; Amateur Radio Satellites are truly an exciting opportunity for education. ■

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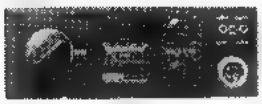

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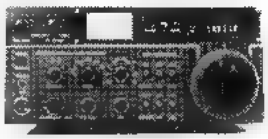

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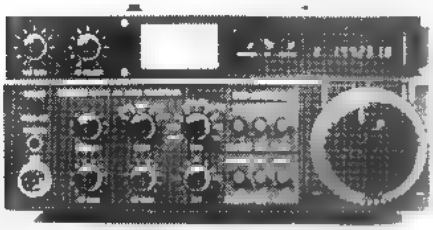

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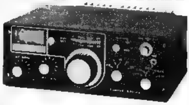

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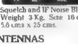

- Frequency range 108-136.975 MHz
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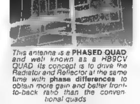

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USER REVIEW: THE SX100 SCANNING RECEIVER

Mark Stephenson VK3NOY

INTRODUCTION

Many old-timers may remember the SX 100 as a general coverage HF receiver made by Hallicrafters many years ago, but this unit manufactured by the Japanese JIL company is also a receiver but any similarities then end

The SX 100 is a solid state scanning receiver designed to receive FM transmissions in 5 kHz steps within the ranges 30-53.995 MHz, 140-179.995 MHz and 410-513.995 MHz. The unit requires no crystals as frequency selection is controlled by a single LSI chip and basically the design of the receiver is modelled on the standard concept double conversion superheterodyne using 10.695 MHz as the first IF and 455 kHz as the second IF. This is followed by the second IF amplifier, FM detector and audio amplifier.

The SX 100 Scanning Monitor Receiver.

OPERATION

No time at all was taken to master the operation of the unit. The front panel design is straightforward and pleasing in appearance, although operationally, as with most "calculator type" keyboards, the wrong button pressed led to some undesirable results. With careful placement of fingers when pushing the rather small keys errors can be avoided. The entry board keys for frequency selection are located to the left of the unit adjacent to the seven figure green fluorescent indicator board. The keys are arranged in 5 rows of three keys, the first ten being numerals from one through to zero and the other five being "specialist" keys enabling entry, scanning and memory of desired frequencies.

The specialist function keys are marked ST, FR, SW, MW and SP. Above the digital display are 16 keys marked MI through to MI6. Each key is a memory function and at any one time any or all of the 16 frequencies desired may be stored in the unit's memory. To enter a wanted frequency in any memory position the desired frequency is dialled up using the numerical keyboard and using the ST key for decimal places indicating the division of MHz and kHz. Having then pressed the MW key (memory write) the frequency is now ready to be stored in the position wanted, i.e. MI-MI6. This process can be completed any number of times until the memory bank is full. At any time frequencies may be changed in any position in the memory

To the right of the digital display are three keys marked "SEEK", SCAN A and SCAN B. These when used in conjunction with the specialist keys described before provide a variety of scanning and seeking capabilities. With all 16 memory positions filled by pressing Scan A all will be scanned at the rate of 4 channels per second until a signal activates a locking circuit. Similarly, the scanning can be stopped on any frequency by depressing the ST key. By depressing the SP key the scanning speed will double to 8 channels per second If at any stage it is desired to only scan say, for example, three of the sixteen already programmed into the unit then by pressing SW followed by those required and then Scan B, only those channels required will be monitored, the rest will be "SKIPPED".

The SEEK function enables the unit to start at a frequency and search for a signal. When a signal appears the unit will pause and then continue scanning. The search rate can be improved from 5 channels per second (5 kHz split) to 10 channels per second by utilising the SP key.

Although the main interest in the unit is the receiver, it also incorporates a clock showing the day and month. This can be set by depressing the four keys representing the date wanted, i.e. November 24 would enter as 11 24. The display will then show 11 24 which is the normal way of showing the date in the USA but not here. Amateurs may find the clocks a little disappointing, aside from the reverse date process in that the clock will only read in 12 hour periods, not good for the hardened GMT man.

ROAD TEST

The unit is adaptable to both AC and DC and is supplied with leads for a pure DC source at 12-16 volts and a step down unit enabling use from a normal 240 volt source.

Because of its versatility the unit was first tested in a vehicle mounted beside the driver using only the telescopic 4 to 22 inch whip which screws into a connecting hole at the top of the unit. The external antenna uses a Belling Lee plug and as no antenna with a suitable plug was available, the supplied telescopic whip which measures from 4 to 22 inches long (depending on the frequency of operation) was used.

Results were excellent. With the unit sitting on the floor beside the driver the Mount Macedon repeater VK3RMM, the Geelong repeater VK3RGL and stations on simplex channel 6500 (146.500) at ranges varying from 10 to 15 miles away were audible and relatively noise free. Ignition interference was negligible. On UHF commercial services were extremely strong and no difficulty was experienced in hearing base stations talking to mobile units and vice versa. The scanning facilities made listening on various amateur frequencies simultaneously enjoyable and undesired frequencies could be easily locked out and the remaining scanned effectively. The instruction manual supplied with the unit quotes sensitivity as 0.5 uV without giving details on signal/noise ratio or quieting, nonetheless the receiver's performance with a meagre antenna and location was very impressive.

As a base station with a good quality antenna the receiver performed, as expected, very well indeed. Mobile units on simplex could be heard over large distances and repeaters mentioned above were fully quieting strength nine plus many dB.

As this is the first unit we have received it would be interesting to compare the SX 100 with similar units on the market. For the avid VHF/UHF listener and for those wishing to listen to amateur operators on VHF or UHF the SX 100 would be a worthy unit to consider.

The SX 100 is distributed by GFS Electronics of 15 McKeon Road, Mitcham. ■

SUNSPOT CYCLE 21 — TO DATE

Len Poynter VK3ZGP/NAC

Cycle 21 started in March 1976 when the previous cycle went out with a minimum of 12.2. Predictions for the peak of the new cycle ranged from a mere 50 to a massive 230. The more conservative predictions was for a peak of around 150 late 1979 or early 1980.

Here are the figures to date.

SUNSPOT MONTHLY MEANS

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1976	8.1	4.3	21.9	18.8	12.4	12.2	1.9	16.4	13.5	20.6	5.2	15.3
1977	16.4	23.1	8.7	12.9	18.6	38.5	21.4	30.1	44	43.8	29.1	43.2
1978	51.9	93.6	76.5	99.7	82.7	95.1	70.4	68.1	138.2	125.1	97.9	122.7
1979*	165.8	138	137	102.8	134.6	150.5	159.6	143.5	188.7			

*Provisional means.

SMOOTHED SUNSPOT NUMBERS

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1976	15.2	13.2	12.2	12.6	12.6	12.2	12.9	14	14.2	13.4	13.4	14.8
1977	16.6	18.2	20	22.2	24.2	26.4	29	33.4	39.2	45.6	51.8	56.9
1978	61.3	64.5	69.6	76.9	83.2	89.4	97.4	104	108.4	111	113.4	117.8
1979	123.8	131	136.7									

The running smoothed mean is always six months behind.

At this stage the peak of cycle 20 of 110.6 in November 1969 has been exceeded. Also the highest monthly mean of cycle 20 of 135.6 in March 1969 has also been exceeded.

The other solar activity indice — the 2800 MHz solar flux looks like this:

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1976	74	71	77	76	71	71	68	75	73	76	73	77
1977	77	82	77	78	80	92	81	84	100	97	94	102
1978	110	146	142	149	147	142	131	114	138	158	152	175
1979	203	204	186	175	166	185	169	165	202	219	(212)	(214)
1980	(215)	(214)	(211)	(208)								

In brackets (215) predictions.

Of interest to many are the OHL/SARGENT predictions for the running smoothed sunspot number. It uses the relations of geomagnetic activity in the declining year of a cycle to project the run of the oncoming cycle. They were made back in 1977.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1978	58.6	64.4	69.6	75.0	80.0	85.1	89.5	93.6	97.6	99.7	103.3	107.1
1979	110.8	114.6	116.8	120.3	124.5	127.8	131.1	136.1	138.2	140.8	145.0	148.1
1980	151.5	153.4	151.4	152.0	153.6	152.2	150.9	149.8	146.2	145.4	143.7	141.2

Generally they equate well with the Zurich numbers but on the low side at this time. It will be interesting to see how they compare fully with observed data. Even at this stage it looks like quite a lot will be made of these predictions in future sunspot cycle predictions.

It still looks good for a few years yet. The VHF scene for 1980-81 looks good, perhaps even through until 1982. The 6 metre fraternity will be happy.

Time you settled down to charting geomagnetic activity before the next equinox in March 1980. The recurring phenomenon due to solar rotation, approximately 26-27 days, is well worth watching. Start charting daily Solar Flux and A Indices to be one of the best informed operators. Saves a lot of time listening to nothing in an otherwise dead period.

A new service available from our Ionospheric Prediction Service is worth a phone call to (02) 269 8614 on half price STD at night.

The recorded message is updated daily around 2330 UT, or more often if events dictate. Take particular note of the critical frequency observation at the end.

IPS are to be commended for their excellent service which commenced on October 1, 1979. Perhaps it could be added to VNG like WWV?

Well 1979 is now over. What will 1980 hold in store? It should give plenty of service to the ardent DXer. Just listen on any of the bands.

73. Lots of DX in 1980.

■

Len VK3ZGP/NAC, Len also prepares our Prediction Charts each month.

JOHN MOYLE MEMORIAL FIELD DAY CONTEST — RULES — 1980

Amateur operators and Short Wave Listeners are invited to make this contest, held in the memory of the late John Moyle, a huge success. Contestants may participate either as individuals or as part of a group. There are two divisions in this contest. The first is for 24 hours continuous operation, and the second for any continuous period of 6 hours. Either period must be within the 26 hours available.

CONTEST PERIOD
From 0400Z 9 February 1980 to 0600Z 10 February 1980.

OBJECTS
The operators of portable field stations or mobile stations within the VK and P2 call areas will endeavour to contact other portable, mobile or fixed stations in VK, P2, ZL and foreign call areas on all bands.

RULES

1. In each division there are 8 sections.
(a) Portable field station, transmitting phone.
(b) Portable field station, transmitting CW.
(c) Portable field station, transmitting open.
(d) Portable field station, transmitting phone, multi-operator.
(e) Portable field station, transmitting open, multi-operator.
(f) VHF portable field, or mobile station, transmitting.
(g) "Home" transmitting stations.
(h) Receiving portable and mobile stations.

2. In each division, 24 or 6 hours, the operating period must be continuous.

3. Contestants must operate within the terms of their licence.

4. A portable field station must operate from a power supply which is independent of any permanent installation. The power source must be fully portable, i.e., batteries, motor generators, solar panels, etc.

5. No apparatus may be set up on site more than 24 hours before the contest.

6. All amateur bands may be used, but cross band operation is not permitted.

7. Cross mode is permitted, but note Rule 21.

8. All operators of a multi-operator station must be located within approximately an 800 metre diameter circle.

9. Each multi-op. transmitter should maintain a separate log for each band. A 2 FM rig may be separate from 2 AM or SSB rig, but note Rule 11. A separate QSO number series is required for each band.

10. All multi-op. logs should be submitted under one call sign.

11. Only one multi-op. transmitter may operate on a band at any one time.

12. RS or RST reports should be followed by serial numbers beginning at 001 and increasing by one for each successive contact.

13. **SCORING FOR PORTABLE FIELD STATIONS AND MOBILES.** Portable field stations and mobiles, outside entrant's call area — 15 points. Portable field stations and mobiles within entrant's call area — 10 points. Home stations outside entrant's call area — 5 points. Home stations within entrants' call area — 2 points.

14. **SCORING FOR HOME STATIONS.** Portable field stations and mobiles outside entrant's call area — 15 points. Portable field stations and mobiles within entrant's call area — 10 points.

15. Portable field stations may contact any other portable field station twice on each band and mode (10-160) during the period of the contest provided that at least 4 hours elapse after the previous contact with that station on that band and mode.

16. Stations may be worked repeatedly on 52 MHz and above providing 2 hours have elapsed since the previous contact on that band and mode. Note that FM, AM, SSB and any other voice modes are grouped together as PHONE.

17. Operation via active repeaters or translators is not acceptable for scoring.

18. All logs shall be set out under headings of date-time in GMT, band, emission, call sign, RST sent, RST received, and points claimed. List contacts in correct sequence. There must be a front sheet to show — name, address, division, section, call sign, call signs of other operators, location, points claimed, equipment used and power supply. You must also certify that you have operated in accordance with the rules and spirit of the contest.

19. Certificates will be awarded to the highest scorer of each section of the 6 hour and 24 hour division. The 6 hour certificates cannot be won by the 24 hour entrants. Additional certificates will be awarded for excellent performance.

20. Entrants in sections a, b, c, d, e and f must state how power for transmitting is derived.

21. All CW-CW contacts count double. Cross mode contacts count single.

22. Logs to be postmarked no later than 28 February 1980 and sent to FCM, Box 1065, Orange 2800.

RECEIVING SECTION
This section is open to all short wave listeners in VK and P2 call areas. Rules are as for transmitting stations, but logs do not have to show report and serial number of the second station. Logs must show the call sign of the portable or mobile station heard, the report and serial number sent by that station, and the call sign of the station called. Scoring is as shown in Rule 14 for home stations. A station calling CQ does not count. Portable and mobile stations, which must be listed in the left hand call sign column of your log, alone count for scoring. Stations in the right hand column may be any station contacted. A certificate will be awarded to the highest scorer of each of the 6 and 24 hour divisions, individual or multi-operator entries. Certificates will be issued for excellent performance. ■

WIA FEDERAL VIDEO CASSETTE LIBRARY

J. Ingham VK5KG

Since its inauguration over a year ago the WIA Federal Video Cassette Library has grown to the extent where rationalisation of its operations has been necessary. The following tells how your radio club can take advantage of this free service offered in the interests of promoting Amateur Radio.

There are three categories of programme.

Group A are those programmes for which the WIA does *not* hold copyright and which are available for loan ONLY and are not to be copied or transmitted. These are available on loan from the WIA Federal Videotape Co-ordinator upon receipt of —

1. Stamps to cover postage of the videocassette to you, and
2. A statement signed by a responsible officer of your club to the effect that the videocassette will be returned promptly upon use and that while it is in his care it will not be copied or transmitted over the air.

Group B are programmes for which the WIA holds copyright. As it is impractical to hold sufficient numbers of each of these to cater for every request for loan, these are available *ONLY* by supplying your own videocassette on to which the programme of your choice will be copied for you to do with as you wish.

Group C are programmes which are not intended as formal, permanent programmes. They are simply videotaped lectures, mostly recorded at the VK5 WIA monthly meetings. These will be of particular interest to country clubs which may have had until now difficulty gaining access to the same standard of technical lectures as their city cousins. Group C videocassette masters will be held for no onger than a year, so if you see a title that may interest your club don't hesitate to send in your request.

Both Groups B and C are ordered in the same way — send your request to the Federal Videotape Co-ordinator together with —

1. A blank videocassette of acceptable format, and
2. Stamps to cover the return postage of the videocassette to you.

GENERAL POINTS

The only acceptable videocassette formats at present are the ¾ in. Umatic and the Philips ½ in. N1500 Regrettably, we cannot as yet supply programmes on the VHS or Betamax formats. Although this service is free *all* requests must include prepayment of return postage in stamps. As a guide a 60 minute Umatic videocassette and box weighs 900 g, a 30 minute 775 g, both plus wrapping. An extra 50c should be allowed for a padded post bag

Order in plenty of time, at least one month ahead, to allow time for processing and mail delays. Urgent requests involving "air parcels post" or "priority paid" are much more expensive!

In "emergencies only" Federal Executive WIA have available for loan one copy of each Group A and B programme. However, don't rely on this as the programme you want may already be on loan or booked for Federal Executive use. ■

Group	Title	Approx. Duration	Colour/ B & W	Availability: WIA Fed. VTR Co-ord. Loan	WIA Fed. VTR Co-ord. Copy Service	Fed. Exec. Emerg. Loan
A	"G6CJ Aerial Circus"	1½ hrs	B & W	√	–	√
A	"7J1RL DXpedition"	1 hr	Colour	√	–	√
B	"Official Opening of Burley Griffin Building" (VK5 HQ)	50 m	Colour	–	√	√
B	ARRL Films —					
	"This is Amateur Radio"	15 m	Colour	–	√	√
	"Moving up to Amateur Radio"	15 m	Colour	–	√	√
	"The Ham's Wide World"	30 m	Colour	–	√	√
B	"This Week Has 7 Days" looks at Amateur Radio	25 m	Colour	–	√	√
B	"Amateur Radio — The National Resource of Every Nation"	6 m	Colour	–	√	√
B	"The VK5 ATV History"	20 m	Colour	–	√	√
B	"ATV in Aust. 1976" (made for British ATV Club)	30 m	Colour	–	√	√
C	Lecture on "Long Wire Antennas" (VK5RG)	40 m	B & W	–	√	–
C	Lecture on "RTTY" (VK5QX)	40 m	B & W	–	√	–
C	Lecture on "Tracking Oscar" (VK5HI)	40 m	B & W	–	√	–
C	Lecture on "The Signal to Noise Story" (VK3ATY)	45 m	Colour	–	√	–
C	Lecture on a "Hamshack Microcomputer" (VK3AHJ)	10 m	Colour	–	√	–
C	Lecture on the "Apollo 13 Disaster" (VK5ZJB)	1½ hrs	Colour	–	√	–
C	(Coming Soon — "Microprocessors") (VK5PE)	?	Colour	–	√	–

WIA 1980 SUBSCRIPTIONS

These are the 1980 WIA subscription rates:

	$	Grades
VK1	24.00	All
VK2	22.00	Full
	20.00	Associate
	17.00	Student*
	12.00	Pensioner*
	12.00	Family†
VK3	23.00	Full
	20.00	Associate
	12.00	Student*
	12.00	Pensioner*
	15.80	Family (full)†
	12.80	Family (associate)†
VK4	20.00	Full & Assoc. Metropolitan
	18.50	Full & Assoc Country
	7.50	Student*
	13.00	Pensioner*
	9.00	Family†
	17.00	Club (with AR)
	9.00	Club (no AR)
VK5	23.00	Full City
	21.50	Full (Country) & Associate

	11.50	Student*
	11.50	Pensioner*
	4.50	Family†
VK6	22.00	Full
	21.00	Associate
	12.50	Student*
	12.50	Pensioner*
VK7 Zone 1	20.00	Full & Associate
Zone 2	22.00	Full & Associate
Zone 3	22.00	Full & Associate
Zone 4	23.00	Full & Associate
All Zones	12.00	Student* and Pensioner*
Zone 1	12.00	Family†
Zone 4	15.00	Family†
Others	14.00	Family†

(Note VK Zones: Zone 1 members outside VK7; Zone 4, Postcodes 7256, 7305 to 7331, 7466 to 7470; Zone 2, S & 3, N.)

* Only for members as approved by the Division concerned.
† No AR.

NEW MEMBERS

Add joining fee — VK2 $2.00, VK5 $1.00, VK7 $1.00.

The Federal part of subscriptions, included in the above rates, as appropriate, are —

AR	$7.95
IARU	0.30
Federal	8.25
Total	$16.50

■

COMMERCIAL KINKS

With Ron Fisher VK3OM

3 Fairview Avenue, Glen Waverley 3150

MORE ON THE YAESU FT-75

It seems that every few months our Assistant Editor, Ron Cook VK3AFW comes up with a new modification to his FT-75 transceiver. Always popular with novices and full calls alike, these rigs can often be purchased at most reasonable prices on the secondhand market.

But on with the modifications and over to Ron.

"The external VFO as used with the FT-75 sometimes causes RF feedback when operated on 10 metres. Experience shows that a number of 'cures' either singly or all together are effective. They are listed in the order that they should be administered.

(1) Reduce the length of the transceiver to VFO connecting lead. 300 mm is not too short.

(2) Connect a good RF ground to the back panel under the wing nut provided If a good ground is not available, use a 2.4m long radial instead. Keep the distant end as far from the rig as possible.

(3) Re-arrange the placement of the VFO so that it and its leads are as far as possible from the aerial coax and/or ATU.

(4) Check the neutralisation of the PA on 28 MHz.

(5) Modify the VFO circuit as follows:

1. Replace TR5, the emitter follower, with a 2N3866.
2. Replace the 22k base resistor for TR5 with a 1.8k resistor.
3. Wire a 2k trim pot across the 470 ohm resistor in the collector circuit of TR2.
4. Remove the 50 pF coupling capacitor from the collector of TR2 and connect it to the wiper of the 2k trim pot.
4. Set the trim pot for 0.25 volt RMS at the output socket with the FT-75 connected.

These modifications reduce reverse coupling back into the oscillator."

With all of this completed you should have the cleanest sounding FT-75 on ten metres with the exception of Ron's of course. ■

REVERSE REPEATER MODIFICATION FOR THE YAESU FT-227R

The Yaesu FT-227R two metre FM transceiver appears to be rather popular with FM enthusiasts at the moment. It of course offers full coverage of the entire two metre band in effectively 5 kHz steps. It however lacks one important feature, that of instant reverse repeater operation. It's a fairly simple procedure to dial up the required frequency, but under mobile conditions this would involve a short distraction from driving concentration. However all is not lost. Don Moyle VK3YOG has come up with a simple modification to provide instant reverse operation by selecting the +600 kHz position on the mode switch. No other facilities are changed. Now over to Don to tell the story.

"This simple modification can be carried out utilising the plus 600 position, which is of little use at the present time. If you have been using the memory to provide reverse receive on a particular repeater it can now of course be used on a simplex channel. In the new +600 position, the display will read as dialled but this will now be the transmit frequency, receive being 600 kHz below.

It is all accomplished at switch S8, by cutting away one wire, transposing two others and by adding two new links. As this involves getting at all sides of S8 start by removing the front panel from the transceiver and then free S8. By following the 'Before and After' circuit diagrams you will have no trouble, however a small fine tip soldering iron is necessary

In conclusion it might be of interest to point out that the FT-227R instruction books do not always give correct alignment data. In several cases alignment points are incorrectly identified. Check carefully TC-302 through TC307. In my book, an early one, they are all identified one number lower than they actually are. It appears that later books have corrected this particular one but that other errors are possible." ■

AMATEUR SATELLITES

R. C. Arnold VK3ZBB

1. As from January 1980 AMSAT will publish a new quarterly magazine called "ORBIT". This would seem a must for all those seriously interested in amateur satellites.
2. Those contemplating joining AMSAT are advised that subscriptions will be substantially increased in July 1980. Present subscriptions are $US10.00 p.a. (plus $3.00 for airmail magazine) of $US100 for Life membership.
   The address again is PO Box 27, Washington DC, 20904, USA.
3. Jim P29ZFB has now qualified for membership of Mode "J" Club.
4. The Orbit Predictions for January 1980 are based on the following parameters:

Time per orbit	114.944753 min.	103.117202 min.
Increment	28.737804°W	25.804622°W

For newcomers, I should explain that the tables give the estimated time and position of the satellite's first crossing of the equator each GMT day.

To convert these figures to local acquisition times, references are —

OSCAR 7 — "Amateur Radio", October 1972.

OSCAR 8 — "Amateur Radio", October 1978 and January 1979, or at Dick Smith shops a copy of the AR October 1978 "Insert" is available. ■

[illegible] — JANUARY 1980

	OSCAR 7			OSCAR 8		
Date	Orb. No.	Eqx Z	Eqx °W	Orb. No.	Eqx Z	Eqx °W
1	23456	0003	68	9295	0037	68
2	23469	0058	82	9309	0041	68
3	23481	0151	94	9323	0044	67
4	23494	0051	78	9337	0046	66
5	23507	0145	92	9351	0052	70
6	23519	0045	77	9365	0055	71
7	23532	0138	90	9379	0059	72
8	23544	0038	76	9393	0103	73
9	23557	0132	89	9407	0106	75
10	23569	0032	74	9421	0110	76
11	23582	0125	87	9435	0113	77
12	23594	0025	72	9449	0117	78
13	23607	0119	86	9463	0121	80
14	23619	0019	71	9477	0125	81
15	23632	0112	84	9491	0128	83
16	23644	0012	69	9505	0132	84
17	23657	0106	83	9519	0135	85
18	23669	0005	67	9533	0139	86
19	23682	0100	82	9547	0143	87
20	23695	0155	95	9560	0003	62
21	23707	0054	79	9574	0007	63
22	23720	0148	93	9588	0011	64
23	23732	0047	78	9602	0014	65
24	23745	0142	92	9616	0018	67
25	23757	0041	76	9630	0021	68
26	23770	0135	90	9644	0025	69
27	23782	0034	75	9658	0029	70
28	23795	0129	88	9672	0032	72
29	23807	0028	73	9686	0036	73
30	23820	0122	87	9700	0039	74
31	23832	0022	72	9714	0043	75

VHF-UHF

An expanding world

Eric Jamieson, VK6LP

Forreston, S.A. 5233

AMATEUR BAND BEACONS

Freq.	Call Sign — Location
50.005	H44HIR — Honiara
50.008	PY1RO — Brazil ‡
50.010	HL9TG — Seoul *
50.023	HH2PR — Haiti
50.025	6Y5RC — Jamaica
50.030	ZS6PW — South Africa *
50.035	ZB2VHF — Gibraltar
50.036	HC1JX — Quito, Equador ‡
50 039	KL7CDG — Anchorage, Alaska *‡
*50.040	ZS6VHF — Edenvale, South Africa †
50.040	WA6MHZ — San Diego, California
50.048	VE6ARC — Alberta, Canada †
50.050	K6FV — San Francisc †*
50.050	ZS3E — South West Africa †
50.060	ZS6LN — South Africa *
50.060	VE6NAB — Alberta †
50.065	WA9FEF — Illinois †
50.060	PY2XB — Sao Paulo, Brazil †
50 065	WB5ZRL — New Orleans *
50 073	W7KMA — Arizona *‡
50.075	HK3/4 — Columbia (repeaters)
50.090	W1AW — Connecticut †
50.090	TI2NA — Costa Rica
50.096	VE1SIX — New Brunswick
50.090	WA6JRA — Los Angeles *‡
50.093	WA8FTA — Ohio *
50.098	K7IHZ — Arizona *
50.100	ZS6HVB — South Africa *
50.101	FO8DR — Tahiti *
50.103	N6AJD — Ohio *†
50.104	KH6EQI — Pearl Harbour
50.110	KG6JIH — Guam *
50.110	JD1YAA — Marcus Island
50.110	KX6?? — Marshall Islands *
50.110	KG6RO — Saipan *
50.110	AL7C — Anchorage, Alaska *
50.498	5B4CY — Cyprus
51.002	ZL1BPW — Auckland *
51 989	YJ8PV — New Hebrides
52,100	VK0DC — Casey Base
52.200	VK8VF — Darwin
52.300	VK6RTV — Perth
52 350	VK6RTU — Kalgoorlie
52 400	VK7RNT — Launceston
52.440	VK4RTL — Townsville
52.450	VK2WI — Sydney
52 500	JA2IGY — Nagoya
52.500	ZL2VHM — Palmerston North
52.510	ZL2MHF — Mt. Climie
52.600	VK6RTW — Albany
52 900	VK6RTT — Carnarvon
53 000	VK5VF — Mt. Lofty
144.010	VK2WI — Sydney
144 400	VK4RTT — Mt Mowbullan
144.475	VK1RTA — Canberra
144.500	VK6RTW — Albany
144 600	VK6RTT — Carnarvon
144 700	VK3RTG — Vermont
144 800	VK5VF — Mt. Lofty
144 900	VK7RTX — Ulverstone
145.000	VK6RTV — Perth
145.100	ZL1VHF — Auckland
145.150	ZL1VHW — Waikato
145.200	ZL2VHF — Wellington
145 250	ZL2VHP — Manawatu
145.300	ZL3VHF — Christchurch
145.400	ZL4VHF — Dunedin
432.400	VK4RBB — Brisbane
432.475	VK7RTW — Ulverstone
433 000	ZL2UHF — Wellington
433.150	ZL1VHF — Waikato
433.200	ZL3UHF — Christchurch
433.250	ZL2VHP — Manawatu
10370	ZL2UHF — Wellington

* Denotes attended operation.
† Denotes new listing.
‡ Denotes change of frequency or call sign.

Bill W3XO, conductor of "The World Above 50 MHz" in QST responded to my invitation to have a mutual upgrading of the beacon list in both hemispheres, with the result there are some additions and changes to frequencies and call signs as shown above. We hope the list is accurate, but the 6 metre listings are difficult to keep correct owing to pressures in some areas for spectrum space.

The North West Branch notes in "QRM" for November briefly mention a new beacon frequency of 144.470 MHz; I wonder if this means a new beacon on the north or west coast, if well located, could be heard over a wide area.

SIX METRES

It's been a bit quiet considering we have been passing through the latter stages of the spring equinox. From the VK5 viewpoint the last of the JA openings occurred on 30-10 about 0100Z, and on 13-11 0000Z to JA2, JA3. On 15-11 band opened to VK7JG at 0000Z when VK5SV and VK5ZBU worked him. Later 0745 to 1200Z open to VK7 again with 11 stations on from there, and at least 18 VK5s. Signals to 5 x 9 plus. Short skip into Victoria noted, with VK3CCM from the Gippsland area on. Garry VK5AS at Cowell on the west coast working stations in Melbourne, though not very strong here. VK7RNT noted also.

On 16-11 VK4 to VK5 from 0000 to 0630Z, starting with stations in Townsville and then coming down the coast. Later VK5ZBU worked VK2VC and VK2ZAY briefly. VK7 also available from 0630Z onwards. Ch. 0 from Brisbane strong. On 18-11 noted and worked Eric VK5ZAG from Kapunda in the north after an absence of some years on 6 metres. His 100 watts very strong indeed at my QTH.

SIX METRES OVERSEAS

On 29-10 JA worked XE on 50 MHz. On 27-10 JA7 and 9 worked the Lords Howe Island DX-pedition; during the period 30-10 to 15-11 there have been consistent workings from JA to W6, VE7, KL7, W7, etc. On 4-11 VE1ASJ worked KG6JDX, whilst on 2-11 HL9TG had his first state-side contact to K6FV, followed on 4-11 by working K7KV and 25 others in W6 and W7.

On 5-11 W6 worked KX6 and DU, whilst JA4, 5 and 6 worked HP2. Big day on 8-11 when JA worked W1, 2, 3, 4, 5, 9, and 0 which are all comparatively rare, plus the easier W6, W7 and VE. It was also reported on the same day in Japan that for the previous two weeks they had worked nothing below the equator, and hadn't heard and VKs at reasonable strength for some time. Same day VE1, 4, 5, 6 and 7 worked Japan, whilst of some significance to those involved was the reception on AM in Japan of a contact between a W4 and W7!

KZ5NW is now signing HP2XPW, while ZB2BL should be returning to 5 before long. According to QST the WAS 50 MHz Award is still being regularly issued in USA. Reports filtering through the northern hemisphere indicate a tremendous equinox there, hopefully we shall have some details soon. Significantly, on 11-11 the solar flux peaked to a record of 383, the highest recorded since Cycle 18, when in 1946-47 it was very high. On 10-11 it was 325, and the day after the peak, on 12-11, the high was 340.

VK6JM SIX METRE OPERATION

Steve VK3OT writes saying John VK6JM is now set to receive and transmit on 52 MHz using a crystal converter, Collins receiver and a home-brew transverter using a 6/40 in the output. Antenna a vee beam with 100 foot legs centred on Adelaide.

He listens at 0800 plus or minus 30 minutes on 52.050, also at 2400Z plus or minus 30 minutes to VK. So far on 27-10 VK7 beacon heard in noise at 0800Z for a few minutes, also Ch. 0 Melbourne. He has a chart recorder running on 6 metres and can see noise increases around his lunch time of 0800Z.

Liaison is via 21.195 at 0500Z, he will check into the VK3PA net just before this on 21.202 MHz. Anyone interested should look him up on 21 MHz as he has tried 28 MHz without result. John is at Davis Base under India in longitude and will be there until late February — should be a good chance for VK stations to obtain another country/continent.

Steve also mentions he hopes to go to Cocos and Christmas Islands after Christmas, signing VK9YT and VK9XT, and to Norfolk Island for next CQWW contest. Good luck, Steve, and thanks for writing.

1979 FACT SYMPOSIUM

The 1979 Future Amateur Communications Techniques symposium held in North Sydney on 29-9 to 1-10 and arranged by Roger VK2ZTB drew attendance from VK1, 2, 3, 4, ZL and P29. Nine papers were presented covering propagation methods and predictions, amateur microwaves use of microprocessors and computers, and solid state amplifier design.

Des VK2AHC, amongst other things, described how to set up a 10 GHz station, and had a large amount of equipment on display. Des apparently regards 1296 MHz as one of the DC bands!

From the report in "The Propagator" it looked like a very worthwhile symposium, and I only wished I lived closer. Subsequent details of the various papers will no doubt be published and should make good reading. Good work, Roger.

FROM CARNARVON AREA

Andy VK6OX sends along some further information on activity from Carnarvon. This is about the only information available these days from anywhere above the 30th parallel, perhaps everybody is too busy working exotic DC to worry about informing the southern States!

6-10 JA1 0930Z 5 x 9. 7-10 JA5EWQ 8-10 JA1 2, 3, 4 and 6. 9-10 JA1, 2, 3, 4, 6, 7 and 9, 16 contacts, 0445 to 0930Z, included were 8J4ITU and 8J7ITU. 10-10 JA1 to 7, 5 x 9, 0425 to 1300Z. 11-10 JA1, 3, 7, 8, 9 and 0. At 0450Z worked JF1UMK on FM, full quieting both ways. Andy used his PRC10 into the A50-12 linear output 5 watts. 13-10 JA7, 8, 9 weak. 18-10 JA2BZY 5 x 7 0845Z. Yoshi reports Y80X should be operating around the end of 1979 or early 1980, possibly as YB0X/9, but not certain yet. 19-10 JA1, 7, 8. Not strong 0927Z. 26-10, 27-10, 29-10 and 5-11, all JA districts at varying times between 0900 and 1000Z, up to 5 x 9. Similar conditions in Perth also.

On 27-10, Wayne VK6WD had a crossband contact 10 metres to 6 metres with Gary W6XJ at 0440Z. Wayne read Gary's CW at 529 for about 1½ minutes just below 52 MHz. Problems occurred due to the sudden inrush of JAs, causing lots of QRM. This is the closest that VK6 have come yet to making a two-way 6 metre contact with W.

Andy also reports on the reported hearing of the beacon VK6RTV by G4BPY (reported in this column last month), and then goes on to say he has at MMT 144/28 transverter and a 16 element beam at 25 feet for two metres.

Aided by a number of troughs the results on two metres have been most rewarding, as indicated 6-10 VK6RTV 559 at 1005Z. VK6RTW 509 1135Z, VK6WD 5 x 7, 144.1, 1250Z. VK6HK 5 x 5 both ways, each running 10 watts 1255Z 16-10 VK6ZT, VK6ZEL and VK6WD, from 1250 to 1540Z. 19-10 VK6WD 559 at 1305Z. VK6XY 569 out 519 in, 1350Z. Both Alb and Andy were excited about this one as it is possibly the longest 2 metre SSB QSO in VK6, about 1150 km.

24-10 Good opening up and down the western coast working VK6ZEL, VK6HK, VK6WD, VK6ZKO, VK6ZFY, VK6ZGG. 6 metres was tried and Jack VK6ZEL worked 5 x 1 both ways. Tried with VK6ZFY at 1437Z 5 x 5 both ways. Also worked VK6ZKO and VK6WD 25-10. Ducting conditions continue, Geraldton repeater Ch. 8 about 300 miles south was accessed with a 2W handbag and 16 element beam (that's cheating you know! — 6LP). Contacts also with Perth, also on 144.100. 30-10 Another trough, worked VK6FM at 0027Z 5 x 9 out, 5 x 4 in, on 144.100. also VK6ZZ and VK6 Q. From 1210Z worked VK6ZKO. 6WD, 6XP, 6VG. 6ZEL and 6BV. At 1437Z Tony VK6BV tried simplex Ch. 40 with Andy, contact easily made with low power. At 1507Z access to Ch. 2 repeater in Perth. 1-11 VK6XO, VK6QA in Geraldton and VK6HK in

Perth, all via the Geraldton repeater 6. 2-11: Many Perth stations and Tony VK6BV in Northam worked 144.100. At 1302Z worked VK6XY in Albany 5 x 6 in, 5 x 1 out, on SSB. Colin VK6ZCC also in Carnarvon joined in at times.

Present plans are to increase power on 2 metres and hopefully to try and work Adelaide! Almost nothing seems impossible on VHF these days. However, the foregoing indicates once more that when even one operator starts up on 2 metres in a more remote area, it is surprising what interest can be stirred up in other areas. What has happened between Carnarvon, Geraldton, Perth and Albany is similar to what happened up and down the east coast of Australia a year or two ago, between various points in Queensland and NSW. The full details of Andy's contacts are included in the hope they will stir up further activity and get the two metre band really going throughout the whole country. Contacts have been made both ends of the continent, it seems time to try and upgrade the situation in the middle, between Alice Springs or Darwin and Adelaide. It only needs someone dedicated enough in either of those centres for something to happen when conditions are right.

OF GENERAL INTEREST

Mick VK5ZDR sent word that VK2ZD will be unable to make the journey to Norfolk Island due to a back injury. Sorry to hear that as such injuries can persist for a long time . . . Ron VK5GM passes along a message from Stan ZL4MB indicating the New Zealand allocation recently made is 50.000 to 50.150 MHz until December 1980, except in the case of Channel 1 TV areas . . . Good tropo on six to western Victoria on 2-10 from VK5 with VK3AXV, VK3OT and VK3AOS at good strength. Re working Okinawa stations. Col VK5RO advises having QSL cards from JD1MO/JR6, KA6HF and JR6HJD twice.

The multi-million dollar storms on 14-11 took a very heavy toll of buildings, property and crops in South Australia. I cannot ever recall hearing and observing such howling winds and hailstones. The trees around my property suffered quite a lot, but miraculously the antenna farm survived! Perhaps the recently erected "with storm-in-mind" system paid off, but they are standing, undamaged.

Not so lucky were Keith and David Minchin VK5SV and VK5KK, at Wasleys, 35 miles north of Adelaide who were right in the path of the storm on its way to the Barossa Valley — they lost their pair of 8 element antennas on 6 metres, and the pair of 16 elements on 144 MHz, plus sundry other smaller antennas. The towers are standing, but the masts have all been bent. We all regret this damage, chaps, and hope the setback will not daunt your spirits too much — I know what it's like, I have been through something similar myself some months ago — but at the very least you may have sufficient time to get the systems going again in time for the autumn equinox. Good luck.

I am sure we are all waiting for a change of heart by P. and T. to allow us an opportunity of working on the 50 MHz and of six metres with the probable peak of Cycle 21 approaching in March. Much has been written and spoken about this, some indication of a change would be most welcome now.

The Editor requires this information a lot earlier than time to allow for publication prior to Christmas, hence not so much to report. Best wishes for the New Year, and may 1980 be a great year for DX. Thought for the month: "It is a pity, but owing to the pull of gravity, it takes less energy to open the mouth than to close it."

73, The Voice in the Hills. ■

LATE NEWS

Bill W3XO of QST has sent a small letter to say that things really exploded on 6 metres during October. He reports "Many many crossband contacts with G, GM, GW, SM, Du, some with LA, OE and OK. E 2W has been on and worked as far as the US Midwest (WO area). The West Coast of USA has had days of JA openings. During one of these WA7RTA, Portland, Oregon, worked 80 JAs. 6th November the East Coast had its first good KL7 opening in 20 years. I finally worked my last State after being on the band for 30 years! I worked seven KL7s, including WA4TNV/KL7 at Shemya, Alaska. Yesterday K3HFV locally worked KX6AQ. I am looking forward to working VK, ZL as well as JA, etc. 73, Bill W3XO" It's enough to make your mouth water!

CHANNEL O RECEIVED IN AUSTRIA

I have received a letter from the Australian Broadcasting Commission, Federal Engineering Division, which refers to a letter from Vienna outlined below. The ABC letter reads —

"You may be interested to learn that a transmission by ABC-TV Ch. O Wagga has been picked up in Vienna.

"Enclosed is a letter from Walter Ertelt OE1WEB, whose claim was accompanied by a cassette recording of the sound reception which, although very noisy at times, has been verified by the ABC as the end of 'Anna and the King' and the start of 'The Ghost and Mrs. Muir' broadcast 1830 local time in Wagga Wagga. Signed D. R. Mackay VK2ZMZ."

It's a continuing saga of 6 metres and the unexpected. This may be one of the few if any actually verified reception reports over such a distance. The Australian autumn equinox will hopefully be something really worth being around for, and if we can use 50 MHz what a great unfolding of world-wide activity there will surely be for us . . . 6LP

RECORDS

NEW AUSTRALIAN 6m BAND RECORD

Confirmation of an Australian record has been given for the two-way CW contact between VK5KK near Wasleys and XE1GE in Cuernavaca on 20th April 1979. The former was on a frequency in the 52 to 54 MHz segment and the latter was on a frequency between 50 and 52 MHz. The distance is 8,747.8 miles or 14,078.2 km for this split frequency QSO of 599 both ways.

NEW VK2 70 cm BAND RECORD

Confirmation has been given of a VK2 record for the two-way SSB contact between VK2BQJ in Oyster Bay and ZL1TAB in Sheffield on 9th January 1979 on 432.25 MHz. The distance is 1,339.7 miles or 2,156.1 km.

WAGGA TV IN VIENNA

Vienna, 25 October 1979

This is a copy of a letter received from the Australian Broadcasting Commission, Federal Engineering, which may be of interest to 6m ops.

I received your TV transmission on channel 0, vision 46.25 MHz and sound on 51.75 MHz today, 25 October 1979, from 0820 GMT (1820 Sydney time) to 0835 GMT (1835 Sydney time) both vision and sound, and until 0900 GMT (1900 Sydney time) vision only. Referable to the World Radio Handbook, I suppose it was your transmitter in Wagga Wagga. The programme contents:

0820 GMT TV serial cast.
0830 GMT Announcement "ABC"
0831 GMT Supp. "Western Movie", starts with a lot of shooting.

Vision quality was very poor to me, due to "plastic". I was unable to tune my set down to the low of 46 MHz, European channels start on 48 MHz. Signal strength was approximately 20-30 dB/uV with unexpected long fading periods of approximately 20 seconds. This leads me to the assumption that not multi-hop F2 propagation was involved, it may have been a sort of "Super-Paddington-Ray". Antenna here is a simple vertical dipole.

I detected your signal while searching for DX signals in the 6 metre amateur band, due to the present extraordinary solar activity. Enclosed an audio cassette with recorded sound channel, partly destroyed by local electrical engine noise. Also enclosed my report in form of my amateur QSL card.

So I hope you can confirm and yet your QSL for that event, such things happen only once in a lifetime. Distance is approximately 16,000 km. I remember well 1957 press headlines "British TV received in Australia". If we consider the distance by frequency product, it may be a new world record of VHF propagation.

Yours sincerely,

Walter Ertelt OE1WEB ■

QSP

EXPOSURE TO RF

In his Technical Topics article in Radio Communications November 1979 Pat Hawker reviews the "so-called" safe limits recommended for exposure to radio frequency generating equipment. "Nothing that I have read" he writes "has indicated that there is any real danger to the public at large, or to a prudent operator, from amateur radio radiation — but if we may increasingly be called upon to convince the public of this we need to understand at least what the debate is all about. At the heart of the problem is the question of how safe is the safe limit (for continous exposure) of 10 mW/cm²? This is the officially recommended standard used in the UK, USA and many other countries. Although set many years ago and based rather pragmatically on the thermal effects of HF/VHF/UHF radiated energy, the vast majority of engineers working in this field are satisfied that it has, in fact, provided entirely effective protection against all biological damage resulting from localised heating, even of sensitive organs such as the eyes. However, again many years ago the USSR and some E. European countries adopted a figure lower by a thousand times 0.01 mW/cm²." WA2UNY, a doctor writing in Ham Radio September 1979 comes up with what appears to be balanced and sensible advice to amateurs —

(1) Avoid HF, high power equipment with antennas in the shack within 3m of living areas.
(2) Avoid direct radiation to the eye by a Tx in the microwave region (looking into a horn antenna or down a waveguide, etc.).
(3) Avoid prolonged close contact with any antenna radiating more than minimal amounts of energy.
(4) Women in early months of pregnancy or those who may become pregnant, should avoid contact with strong HF, VHF and UHF fields.

Somewhat vague and unprecise though these may, nevertheless, writes Pat Hawker one feels that they reflect the current uncertainty and would avoid any possible future recriminations from the public. ■

LICENCE FEES

A new radio licence fee schedule is expected for non-broadcasting stations in Canada from 1st April, quotes a news item in May 1979 Telecommunication Journal. The new schedule introduces the concept of variable fees more representative of the size and complexity of the licensees communications system. More than 1 million general radio service (CB) and amateur licences will not be affected, although these represent 70 per cent of radio station licences in force. The revenue from the new fees is expected to cover the costs of spectrum management in accordance with the principle that the cost of licensing radio stations should not be borne by taxpayers generally. ■

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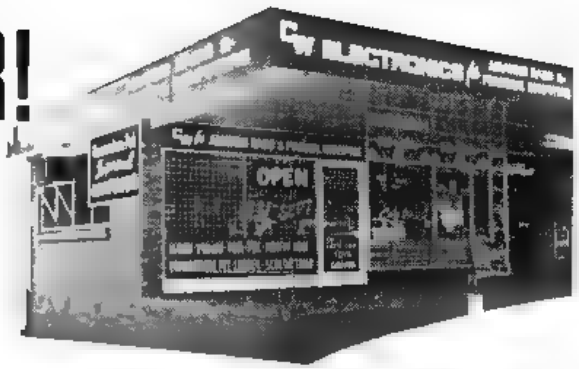

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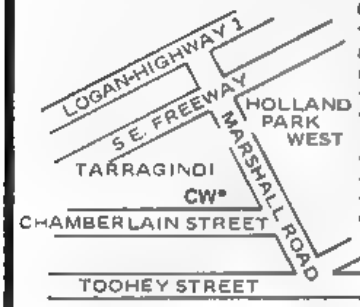

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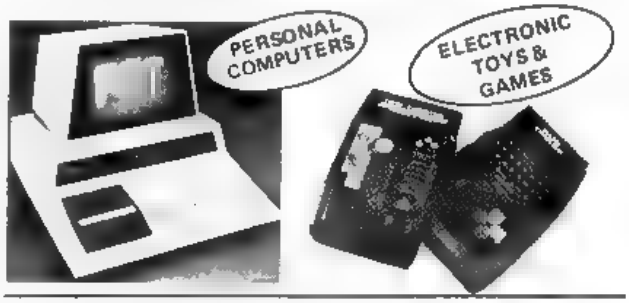

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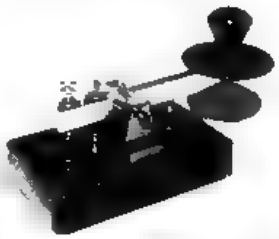

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IC2[illegible]	2m transceiver	$29[illegible]
IC551	6m transceiver	$799.[illegible]
IC280	2m fm remote	$[illegible].00
IC502	6m ssb portable	$2[illegible]9.00
IC202S	2m ssb portable	$[illegible]18.00
IC211	2m all mode	$847.00
IC RM 3	Remote [illegible] unit	$159.00

Coaxial Cable

RG58AU	mil spec 30m reels $13.00
RG2	mil spec per metre — $1.40

Kenwood Transceivers

TS520S	HF transceiver
TS1[illegible]	Solid state 100w
TS120V	Solid state [illegible]w
TS180S	Solid state 10w
	Call us today for a good deal

Monitor Receivers

747	Vicom Aircraft Scanner $[illegible]
210	Bearcat 210 scanner $46[illegible]
HF12	VHF pocket 12 channels $[illegible]49[illegible]
220	Bearcat inc air $5[illegible]
25	Bearcat 50 channels $560.00
FT[illegible]	10 mth old $500.00
TS-820S	10 mth old $8[illegible].00
HF700	New Swan 500w Rec inc P.S. $69[illegible].00
Atlas 21[illegible]	Inc Power Console in mint condition $550.00
M 75	Info Tec RTTY to video Converter $200.00
Model 150	Info-Tech RTTY Keyboard to suit M 75 $200.00

ASK FOR THIS MONTHS SPECIAL

SUMMARY OF CURRENTLY AVAILABLE ICOM TRANSCEIVERS:

Model	Band	Modes	Features	Price $
IC701	160-10M	SSB/CW/RTTY	Solid-state deluxe	1199.00
IC22S	2M	FM	Popular mobile unit	299.00
IC280	2M	FM	Mobile remotable	450.00
IC215	2M	FM	Portable	229.00
IC402	70CM	SSB/CW	Portable	439.00
IC251A	2M	SSB/CW/FM	AC/DC base station	847.00
IC551	6M	SSB/CW	Microprocessor control 10 watts	799.00
IC551D	6M	SSB/CW/FM	100 watt output	850.00
IC255A	2M	FM	New, digital, 25 watts	425.00
IC202S	2M	SSB/CW	Portable	318.00
IC502A	6M	SSB/CW	Portable	269.00
IC260A	2M	SSB/CW/FM	Mobile, digital	tba

ICOM

IC22S FM TRANSCEIVER

* The most popular 2m rig, thousands sold.
* Ideal for mobile as there is no digital display to worry about.

GET WITH THE STRENGTH!

So well known that it is hardly necessary to say much about it!

- Easy to use on the move without looking
- 22 programmable channels — 10 popular ones already done and 12 for you to program to your own choice
- Full reverse repeat at the flick of a switch.
- Superb quality and performance — as thousands of owners will confirm
- Excellent value for money
- Rugged ideal for mobile
- Complete with mobile mount
- Low rece ver noise, excellent sensitivity
- Backed by V COM 90 day warranty

STILL ONLY $299

ICOM

— SIMPLY THE BEST!

ICOM

IC701 HF TRANSCEIVER

ICOM's superior LSI technology takes the lead in Amateur HF. The extremely compact **IC-701** delivers 100 watts output from a completely solid state, no tune (broad band design) final, on all modes and all bands, from 160-10 M. With single knob frequency selection and *built-in-dual VFO's*, the LSI controlled **IC-701** is the choice in computer compatible, multi-mode Amateur HF transceivers.

The **IC-701's** single frequency control knob puts fully synthesized instant tuning at a single finger tip. **WIDE** bandspread, with 100 Hz per division and 5 KHz per turn, is instantly co-ordinated between the smooth turning knob and the synthesizer's digital read-out with positively no time lag or backlash (no waiting for counter to update less operator fatigue). And at the push of the electronic high speed tuning button, the synthesizer flies through megacycles at 10 KHz per step (500 KHz per turn).

The computer compatible **IC-701** LSI chip provides input of incremental step or digit-by-digit programming data from an external source, such as the microprocessor controlled accessory which will also provide remote band selection and other functions.

Full band coverage of all six HF bands, and continuously variable bandwidth on filter widths for SSB, RTTY, and even SSTV, help to make the **IC-701** the very best HF transceiver ever made. **IC-701** include two CW widths, all of this standard at no extra cost.

Sold complete with the high quality electret condenser base mic (SM-2), the **IC-701** is loaded with many ICOM quality standard features. Standard in every **IC-701** are *two independently selectable, digitally synthesized VFO's at no extra cost*. Also standard are a double-balanced schottky diode 1st mixer for excellent receiver IMD, and RF speech provessor, separate drop times for voice and CW VOX, optionally continuous RIT, fast/slow AGC, efficient IF noise blanker, fast break-in CW, and full metering capability.

Price $1199 (AC power supply extra)

VICOM

Available from authorised VICOM dealers throughout Australia.

AWARDS COLUMN

Bill Verrall VK5WV
7 Lilac Ave., Flinders Park, S.A. 5025

BLUE MOUNTAINS LAGOON AWARD (VK2)

Here are the details of another 10/10 award which is available from the Blue Mountains Lagoon Chapter of the 10/10 International net. This award is only available to 10X members for contacts on the 10 metre band.

Net Frequency 28.585 MHz.
Basic Award requires 15 points.
Kookaburra Bar endorsement requires 35 points.
Koala Bar endorsement requires 65 points.
Kangaroo Bar endorsement requires 150 points.

Points may be aggregated to achieve the 150 points required.

You are required to work one committee member and one local member. Each award can be applied for separately if desired.

The cost of the basic award is $2.00 plus an extra $1.00 for airmail to overseas stations. The bars cost $1.00 each, which includes airmail posting.

Chapter membership is available for a fee of $2.00 and this is worth 1 point.

Note: For the third bar, you may work all or any stations at 24 hour intervals. Up to the Kangaroo bar, stations may be worked once only.

DESCRIPTION

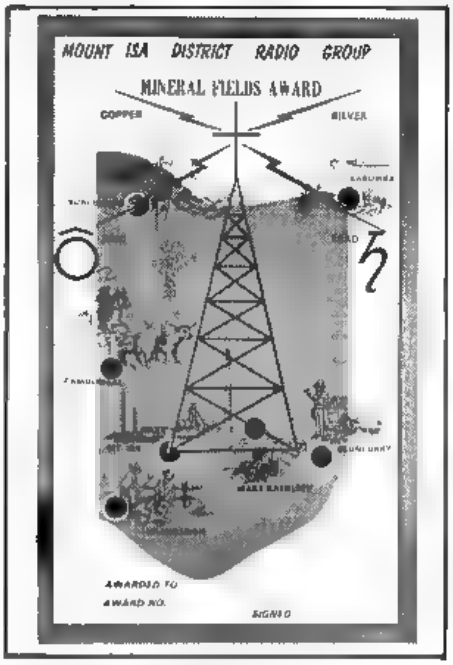
The award measures 300 mm x 220 mm printed in three colours on high quality gloss paper. The border is in dark blue, background in light blue and printing in red.

APPLICATIONS

Applications should be submitted to the Awards Manager, Mr. A. McGrath VK2APD, Mountain Lagoon Road, Bilpin 2758, NSW, Australia.

THE GARDEN CITY AWARD

This award is available from the Darling Downs



Mineral Fields Award.

Brisbane Sun Valley Award.

Radio Club for working stations in Toowoomba, Queensland. The award is available to Australian and overseas amateurs and will also be issued to SWLs.

This award is on a points attained basis as follows

VK and ZL 10 points required by working or hearing DDRC members.

All others 5 points required by working or hearing DDRC members.

Each phone/SSB contact is worth 1 point.

Contacts on CW RTTY or the club station are worth 2 points.

Only one contact per band per member each 24 hour period is permitted for point scoring purposes.

Only contacts made on or after 1st October 1979 will count

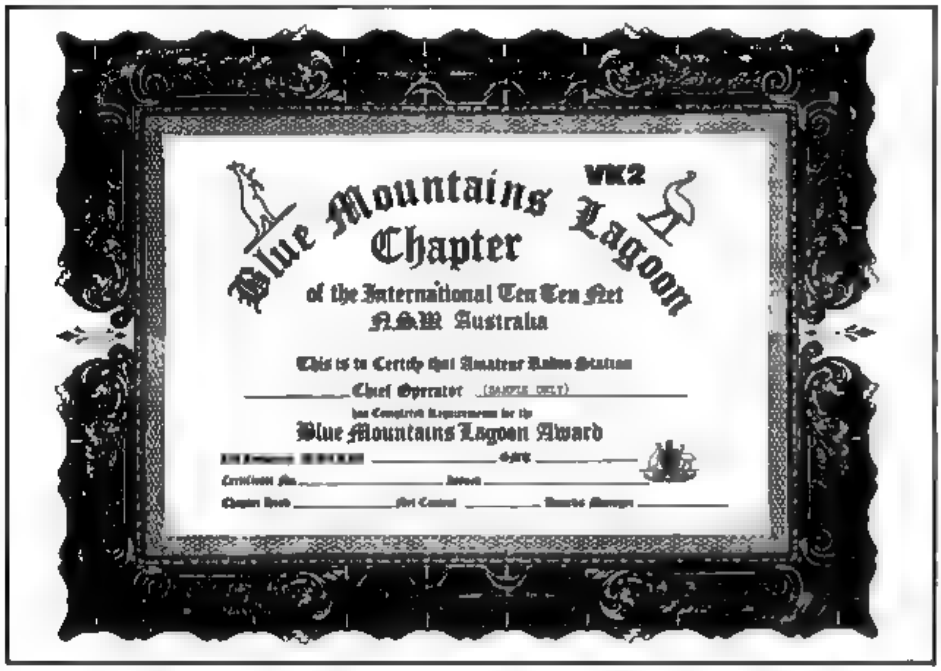
The cost of the award is $1.00 for Australian applicants and $AUST2.00 or equivalent in IRCs for ZL and overseas operators.

QSL cards are not required. Send details of a log extract only

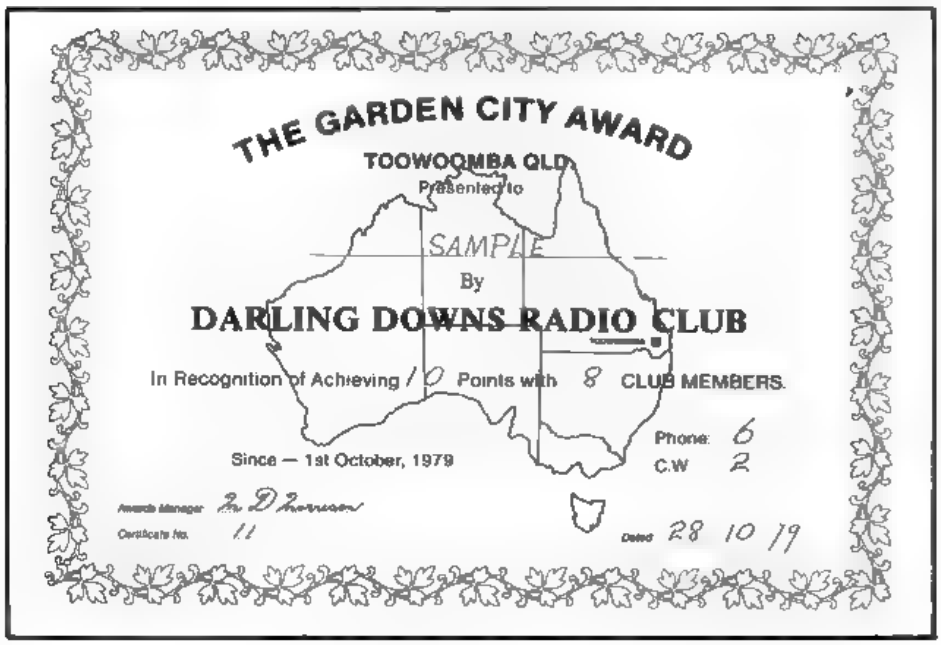
Applications for the award should be directed to the Awards Manager, Darling Downs Radio Club, PO Box 715, Toowoomba, Queensland 4350.

The award measures 335 mm x 230 mm printed in two colours on matt finish white parchment type paper. The outline of the map of Australia is in black and all other printing in red.

Good hunting. ■



Blue Mountains Lagoon Award.



The Garden City Award.

CONTESTS

Wally Watkins VK2DEW
Box 1065, Orange 2800

January:

—/13	ROSS HULL VHF/UHF CONTEST
12/13	ARRL VHF SWEEPSTAKES
12/13	YU 80m CW
12/13	DL QRP CW
19/20	N and S AMERICA RTTY
25/27	CQ WW 160m CONTEST
26/27	FRENCH CW CONTEST

February:

9/10	JOHN MOYLE FIELD DAY
16/17	ARRL DX CW CONTEST
23/24	FRENCH PHONE CONTEST

March:

1/2	ARRL DX PHONE CONTEST
9/10	EUROPE AND AFRICA RTTY
22/24	BARTG RTTY SPRING CONTEST
29/30	CQ WW WPX SSB CONTEST

The French contests should provide some hard to get prefixes from various French possessions around the world. SASE for full details. In the 1979 contest two locals featured in the results — A1 — VK3XB 7,750 points, 31 contacts, and A3 — VK5YY, 12,090, 41. ■

DIVISIONAL NOTES

VK2

Members of the WIA (NSW Division) are asked to note that their annual subscription to the Division becomes due on the 1st January 1980 and is payable within one calendar month. The notices have already been sent by separate mail during December. The subscription is to be returned to the Federal Office at PO Box 150, Toorak 3142 (Clause 27 — Articles of Association)

Members, various sub-groups and suppliers are notified that the Division's financial year (1979) ends on 31st December 1979, and the Treasurer requests that any accounts be finalised as soon as practical. Various groups are advised that your annual report should be in the hands of Council by early February

Nominations for the 1980 Divisional Council will close at 2 p.m. on Thursday, the 14th February, 1980, at the Registered Office — 14 Atchison Street, Crows Nest (Clause 48)

Any business/agenda items for the Annual General Meeting should be lodged at the office before 2 p.m. on the 19th February in time for the next Minibulletin.

The Annual General Meeting of the Division will be held at the Registered Office, 14 Atchison Street, Crows Nest, on Friday, the 28th March, 1980. Business to include the presentation of the report of Council, the Balance Sheet, the election of Council for the incoming year and any other business of which due notice has been given. The meeting is scheduled to commence at 7.45 p.m. (Clause 26).

Further details about the above matters will be included in the various Minibulletins.

T. I. Mills, Secretary, WIA (NSW Division), 14 Atchison Street, Crows Nest NSW. 3rd December 1979. ■

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

72 Church St., Morwell 3840
17-11-79

The Editor,
Dear Sir,

I would like to comment on the article in the QSP column on page 47 of the November issue of AR. The article contained an extract from a letter by "JP" to the Queensland Division of the WIA complaining about the operation of the "Rendezvous Group", which it is claimed is run by the Jehovah's Witness Organisation.

I have on occasions come across this group while tuning over the band and have listened casually for a while before tuning elsewhere. I have heard nothing to imply that the group is run by, or for the benefit of, the Jehovah's Witness Organisation, by which I suppose JP means the Watchtower Society. I would like to state at this point that I am not a member of the above organisation or ever likely to be, as their teachings are anathema to me.

The group seemed to be comprised of people with a common interest and the matters discussed were of a personal nature, involving their work, families and friends, and I accept JP's point that they were all Jehovah's Witnesses. However, JP implied that the group was run as part of the operations of the Watchtower Society. Presumably this means that the group was used for propaganda, evangelism, or to conduct the administrative details of the Society, so avoiding mail and cable costs.

I have heard nothing to support this view and the operations of the group seem to be no different to that of any other group of people with a common interest. The regulations allow amateurs to discuss matters of a personal nature, there is no prohibition on the subject matter of these discussions so long as it is not obscene or otherwise objectionable. Apparently it is Regulation 60(e) that concerns JP, but I can only repeat that the matter I have heard transmitted on this net only concerned the operators in the group.

I can only conclude that JP's observations were coloured by a prejudice against this particular organisation. The group is no more offensive than any other minority group such as bushwalkers, horse breeders or rugby players, who meet regularly on air to discuss a common interest. It is a very dangerous attitude when representations are made at an official level to halt the operations of an on air net, just because the majority of people may not agree with the philosophies of the group concerned.

Yours faithfully,
Kevin L. Feltham VK3ANY. ■

The Editor
Dear Sir,

I would like to take the opportunity through your pages of thanking Mr McKibbin for his comments on my previous letter on the subject of International Correspondence.

I wish to ensure, however, that no misunderstanding exists in either Mr McKibbin's or anyone else's mind for that matter.

I am surprised at the description intimating narrow-mindedness on my part, and I would like to direct Mr McCubbin's attention to the last portion of the last sentence of my letter. Quote, "Just ponder as to how you would manage to write a business letter to someone in Japan in Their Own Language' Perhaps he missed reading that portion of my letter.

I would therefore deny the charge of narrow-mindedness.

Whilst I do speak a little German and can get by with a QSO in the French language, I don't consider any language, other than one's mother tongue, to be necessarily easy to learn. I could well imagine, and indeed expect, even a small French child to be amused at my poor efforts in his native tongue, neither would I take offence at his amusement.

My XYL comes from the north of England and I was born here in Australia. With her accent, the existence of which she so strenuously denies, and my local understanding of pronunciation and expressions, just imagine the "fun" we sometimes have in communication in our own language, English. Thus my first hand experience in problems of this nature.

So Mr. McKibbin or any others who may feel like you about my letter, I must apologise if I conveyed in any manner any semblance of pedantry or egocentricity. I can assure you that such is not the case nor was in fact the intention.

We should all be capable of laughing at ourselves whoever we may be. I often suspect the Irish of being the ones who make up all those jokes about the Irish anyway!

By the way, I think that Victor Harbour is a beautiful place and have always enjoyed visiting there, so please why can't I take any more trips to that lovely area?

Ian Hunt VK5QX. ■

4 Quinn St., Penguin, Tasmania
19th November, 1979

The Editor,
Dear Sir,

I was concerned recently when advised that a practice I had engaged in was not permitted on the amateur bands.

In the north-west area of VK7 a branch activity was to encourage a Sunday morning on the air "get together". This involved novice, limited and full call members. Two main frequencies were used, one on ten metres and the other on repeater 3.

Many stations took part and enjoyed the opportunity to "rag chew" with other stations along the coast. We soon found that most novice operators could listen to repeater 3, but several full call stations had trouble receiving on 10 metres due to local terrain, etc. Being set up for relaying the VK7WI broadcast from HF to repeater 3, I occasionally patched a novice station, after he had given his call sign, on to the repeater for the benefit of all stations in the net.

This turned out to be quite a smooth operation and greatly increased the flexibility of our net.

I had checked the current Regulation Handbook and although there was no direct reference to relaying another station (apart from replaying a recording of another station) I used my commonsense in ensuring that both the novice and myself operated within the terms of our licences, i.e. each giving our respective call signs on our respective bands before and after a patch. I have been advised that this practice is NOT PERMITTED.

This raises several points which I feel need clarification. Firstly, my XYL who has no active interest in amateur radio is allowed to talk on VHF on my transmitter in my presence. Why not a novice via an RF link? Secondly, if the novice also has the limited call but is operating on 10 metres is he, with his permission, allowed to be relayed on to a repeater or is relaying as such just not permitted?

It is understood in the branch that repeaters are primarily for mobile use and any mobile traffic will take priority over "rag-chewing" but the whole exercise was to increase the general local activity.

Surely when we are not causing any interference to any person outside the amateur service or to any station within our bands we should be able to conduct an experiment such as this.

I have heard on the grapevine that the regulation concerning "Third Party Traffic" is involved. "What next?"

Yours faithfully,
[redacted]

EDITOR'S NOTE:
This is a "grey" area at the moment; we know of other novices in the same situation. The P and T Department is aware of these activities and so far have forbidden novices being relayed on to bands they are not licensed to use, same with limited licensees.

The matter of dual licence holders will be referred to the Department for further information.—VK3UV. ■

C.A.R.E.

(COMMUNITY AMATEUR RADIO EVENTS)

SEA RESCUE

Ron Fisher VK3OM, a member of the Publications Committee and Federal Tapes reader, was tuning across the 20m band about 22.00h local time on 11th November when he heard ZL4HI Fin in Dunedin, taking a Mayday call from TI8UF. At the time VK2NHC happened to be visiting Fin and was in his shack.

The Mayday call emanated from a survival raft from the yatch Dauntless, which had been attacked three times by a whale and had sunk about 15.30h NZ time. All the people aboard the yacht were in the raft — Mr Ionis Jones with his wife and two children. By dead reckoning they had estimated their position east of Norfolk Island.

Ron could read signals from the raft and also ZL4HI till 22.30h local time, by which time copy from the raft became difficult. Dan Kelly VK7DK broke in to report good copy from the raft but could not copy ZL4HI. Ron then acted as a relay to ZL4HI who contacted the NZ Search and Rescue Service, which arranged the despatch of an Orion aircraft to the raft's area from Auckland and contacted a Dutch freighter "Freetown" to divert to the area to pick up survivors.

By this time ZL4HI faded out on 20m but did receive advice to QSY to 3.6 MHz, after which

contact with VK3OM was re-established and continued. The relay through VK7DK on 20m continued with advice to them about the Orion search and they should release their EPIR beacon, which they did at 17 15Z. The Orion found them about 17.30Z and the freighter picked them up around 22.30Z and dropped them off on Norfolk Island.

The Australian Coastal Surveillance in Canberra was informed by the NZ Search and Reacue and were aware of the situation. Any similar occurrences should always be reported direct to them, as soon as possible on telephone (062) 47 5244, reverse charges accepted.

One more example of the enormous value of amateur radio to seafarers. ■

AR ADDRESS LABELS

Please check your call sign, name, initials, address, grade and other details on your address labels.

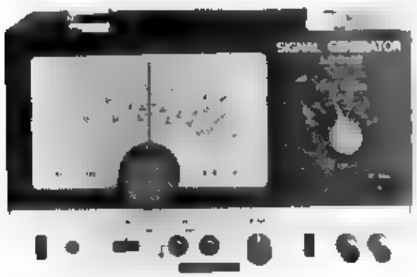
Advise any corrections NOW to your Division or direct to WIA, Box 150, Toorak, Vic. 3142.

- The coding on the label reads: Letter Numeral Two digits One digit Two digits Grade Division Unused Distribution Zone.
- The Call Book data derives from the same EDP file.

AROUND THE TRADE

LEADER LSG16

Leader's popular range of instruments for the Hobbyist is most famed for the RF Generator model LSG16, covering the RF spectrum from 100 kHz to 300 MHz in six ranges, 100 MHz to 300 MHz on harmonics. The LSG16 is available from the sole Australian Agent, Vicom International Pty Ltd., and distributors. ■



NEW 10m FM TRANSCEIVER

GFS Electronic Imports of Mitcham, Victoria, have just announced the release in Australia of a new 80 channel FM transceiver, the Comtronix FM-80.

The FM-80 is a fully synthesized transceiver that runs 10-15 watts output over the frequency range 28.91 to 29.70 MHz (also it can easily be made to operate 28.01 to 28.80) in 10 kHz steps. FM deviation is ± 3 kHz. Channel number is indicated by a bright LED readout. Other features include HI-Lo power switch — one watt (for local conversations) or full output, adjustable squelch for muted stand-by operation and an illuminated meter reading "S" units and transmitter power.

The price of the FM-80 is $289. For more information contact the Australian distributors, GFS Electronic Imports, 15 McKean Road, Mitcham, Vic. 3132. Phone (03) 873 3939. ■

NEW ICOM POWER SUPPLY IC-PS25

Icome have released a new power supply to be used with the new high power 6 metre transceiver IC551D and other matching Icom transceivers such as the IC701.

This new fully regulated supply eliminates heavy power transformers and offers a variation in technique over the usual methods. A switching regulator IC is used containing a reference voltage circuit, OP-amp, comparator and current limiting circuit.

The oscillating frequency of the regulator is around 50 kHz and this high frequency, high voltage AC is rectified and filtered to produce 13.6V DC at a maximum load current of 20 amps.

The circuit also provides short circuit protection and automatic shut-off when the current exceeds 25 amps.

Weight of the unit is only 4.2 kg, a useful saving of 4 kg over the older type. An optional fan is available if continuous operation of RTTY is contemplated. Further information is available from Vicom (03) 699 6700 or their dealers. ■

YOU and DX

Mike Bazley VK6HD

9 James Road, Kalamunda W.A. 6076

One of the reasons that people take notice of rumours is that on occasions a rumour turns out to be true. The part of amateur radio which covers DX chasing, rumours add spice, interest and the possibility of truth. A good example would be the recent 8Z4A operation. The DXpedition had been rumoured for approximately six months prior to the operation and then all of a sudden, there was the pile-up. The moral is to note all you hear on the air, add your own value judgement and then play by ear. Don't worry too much if you missed the 8Z4, "rumour" has it that this neutral zone will not exist much longer!!!

DX NEWS, RUMOURS, FACT AND FICTION

Heard Island is in the news again. An interesting note from Peter VK3DU quotes the following from the Brisbane "Courier Mail" of 30-10-79: "An Australian party will land on Heard Island this summer for the first time in nine years. Its mission will be to reinforce Australia's claim to the Island's known fishing grounds and suspected mineral resources. Theexpedition also will search for signs that other parties have been to the Island since the last known visit by a Franco-Australian team in the summer of 1970-71.

The National Mapping Division has chartered the lighthouse supply ship, Cape Pillar, from the Transport Department for the six week mission from late February to early April. The 16 men in the working party will be drawn from the Mapping Division and the Science and Environments Department's Antarctic Division."

There we have it! Someone is going to Heard Island but will there be amateur activity? There must be a radio operator on the ship so there could be hope. The interesting thing from all the above is that it is fuel for the rumour game. Up to the present I have personally heard of four possible ways of some Heard Island amateur activity. These are:

1. P29 JS plus other operators are hoping to join the ship at Perth.
2. A VK6 is hoping to be allowed to travel on the ship and is looking for WIA support and approval.
2. The ship's wireless operator has been offered $1,000 to take out an amateur licence, make as many QSOs as possible and request all QSLs via his sponsor!
4. A part of DX-minded Ws are prepared to fly down to Perth and pay for their passage on the ship, if permission can be obtained.

There you are, four rumours, and no doubt there will be more before the end of February arrives. As the headlines says, DX News, rumours, fact or fiction?

January is the month when one looks to the future with hope and perhaps I may be allowed to indulge in a few predictions for 1980. I expect H5, S6 and T4 will be added to the DXCC listing, there will be an all time new country from the Carribean. Someone will manager to operate from 7O and BY.

Unfortunately copy for the January AR has to be in the hands of the printer during mid-November and as this is only a couple of weeks since I last put pen to paper there is very little DX news. Those chasing DX on 80m should be able to grab VQ9KK, who seems to appear every evening at 1300Z around 3514 or 3502. Bill puts a couple of CQ calls out and if no takers goes QRT. He has also been heard here in VK6 between 2030 and 2130Z.

If you worked YI1BIF recently, this was a special call from the Baghdad International Fair. QSLs via PO Box 5864. Incidentally YI4SC QSLs are now turning up.

The proposed trip to CR3 land by C5ABK and W4MGN has been postponed. Rumour has it that this may be activated some time in February.

TN8AJ is QRV on 15m (QSL via DM2XLO) and will be in the Congo Republic until July 1980. A list is sometimes taken on 21155 on Saturdays at 1400Z.

T3KC is ex VR1BD, T3PA is ex VR1PJ and T3LA is ex VR3AR, no change in DXCC status. Checking the suffixes, K is for Kiribati, P for Phoenix Islands and I for Line Islands.

Lloyd and Iris Colvin are once again QRV from around the Carribean area. During the CQ Phone test they were heard from J3ABV and recently were copied signing VP2SAX. QSLs via YA5ME, PO Box 2025, Castro Valley, California 94546.

There will be operation from Kingman Reef during January. (It may be over by the time you read this.) All bands SSB and CW are planned with several operators. It is rumoured that this could be the last operation for some time from this spot as the Palmyra Islands could be used as a nuclear waste dumping ground.

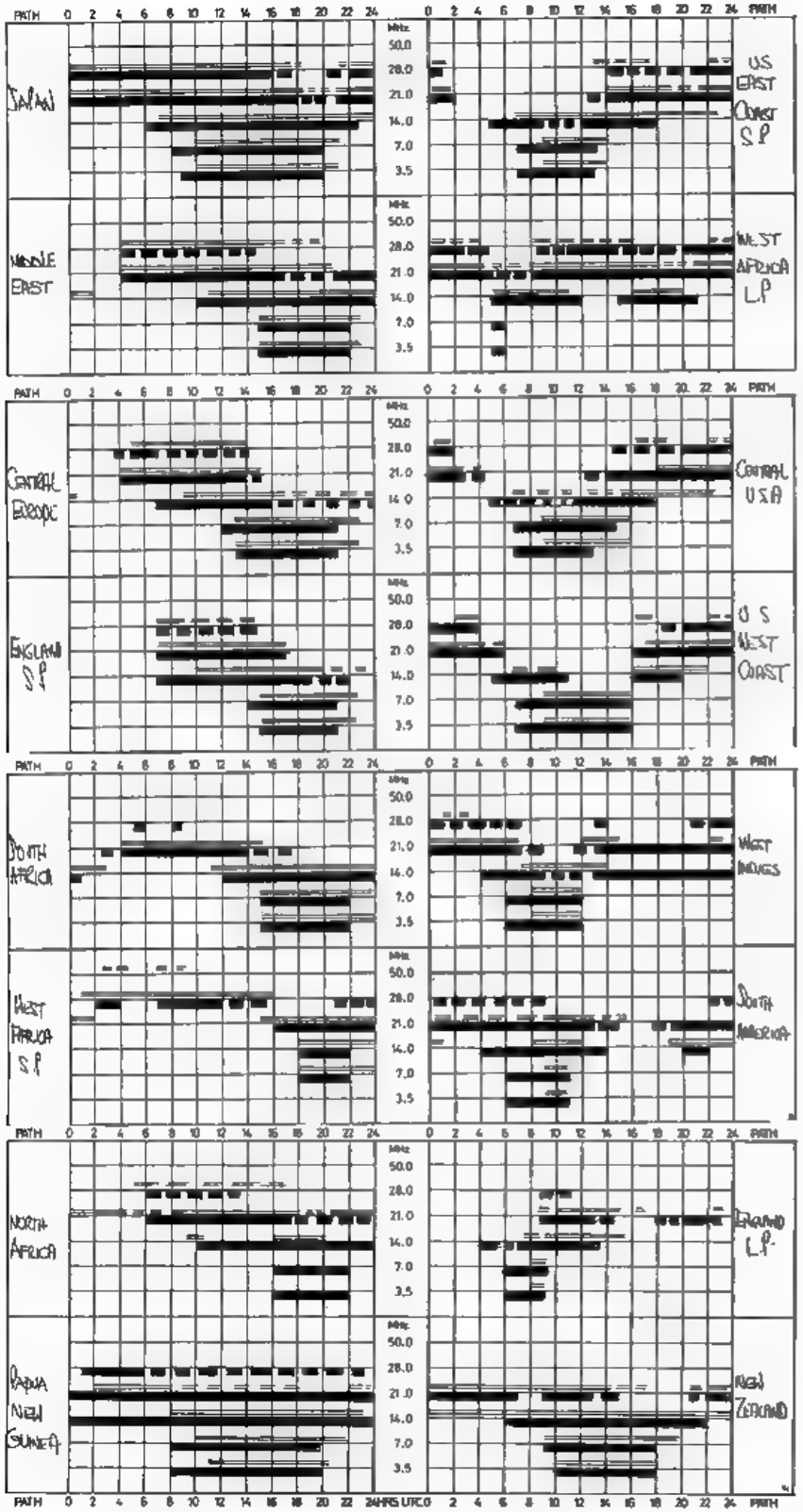
I'm afraid that's all for this month. A Happy and Prosperous New Year to you all. 73 Mike VK6HD.

QTHs YOU MAY HAVE MISSED

A4XHI — PO Box 8530, Salalen, Sultanate of Oman.
DF4NW/A7 — via DARC.
C5ABK — via G3LQP.
FG0DYM — via W3HNK.
HK6GM — Box 777, Pato, Colombia.
J28AP — Box 814, Djibouti.
KG6SW — via W7OM.
KV4AA — via K6PBT (change of manager).
KH6LW/KH7 — via KH6JEB.
LU3ZY — via LU2CN.
S8AAT — Box 750, Umtata, Rep. of Transkei, Southern Africa.
VP1AX — via W4SME.
VP2E — via WA4MAV.
VP2EEG — via W3HNK.
VP2EY — via W3HNK.
VP2MBA — via W7FP.
VP2VDH — via N6CW.
VP2VFK — via N6CW.
VP5MRX — via K8MR.
XF4MDX — via XE1OX.
ZF2BB — via N4IZ.
ZF2BN — via W4HET.
ZF2CD — via W3ODJ.
ZK2VE — Box 100 Niue.
3B9RS — via DJ6QT.
5N0SID — via G4GTQ.
7P8BQ — via K9KXA.
9Q5DH, 9QWH — via WB4CSW. ■

IONOSPHERIC PREDICTIONS

Len Poynter VK3ZGP/NAC



LEGEND

FROM WESTERN AUSTRALIA.

FROM EASTERN AUSTRALIA.

BETTER THAN 50% OF THE MONTH, BUT NOT EVERYDAY

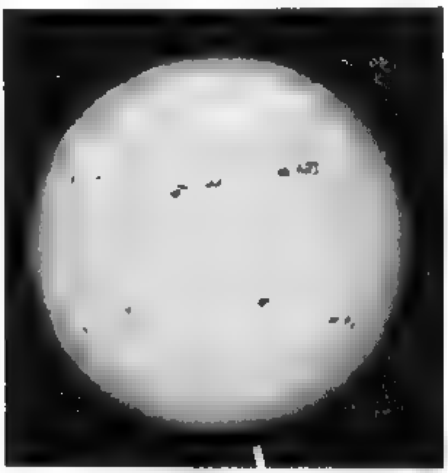
LESS THAN 50% OF THE MONTH.

PREDICTIONS COURTESY I.P.S. SYDNEY.

ALL TIMES UNIVERSAL UTC (GMT).

SUNSPOT ACTIVITY INCREASES

Below is a photograph of the sun taken on 10th November 1979 at 0957 daylight saving time by Grahame Sprott, Director, Solar Section, Astronomical Society of Victoria. The number of sunspots visible is quite high and most should be visible again in the first and last weeks in January. Note the two bands of spots above and below the solar equator. These bands will move closer to the equator as the cycle peaks. For a safe viewing method refer to p. 10 July AR. ■



WICEN

Ron Henderson VK1RH
Federal WICEN Co-Ordinator,
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EMERGENCY SERVICES COMMUNICATIONS PROCEDURE

This issue we continue with the second part of the Emergency Services Communications Procedure paper.

11. PHONETIC ALPHABET

(a) The standard phonetic alphabet is.

Letter	Spoken as	Letter	Spoken as
A .-	Alfa	N -.	November
B -...	Bravo	O ---	Oscar
C -.-.	Charlie	P .--.	Papa
D -..	Delta	Q --.-	Quebec
E .	Echo	R .-.	Romeo
F ..-.	Foxtrot	S ...	Sierra
G --.	Golf	T -	Tango
H	Hotel	U ..-	Uniform
I ..	India	V ...-	Victor
J .---	Juliett	W .--	Whiskey
K -.-	Kilo	X -..-	X-Ray
L .-..	Lima	Y -.--	Yankee
M --	Mike	Z --..	Zulu

(b) Difficult words or groups within the text of plain language message may be spelled using the phonetic alphabet, and preceded by the proword "I SPELL". If the operator can pronounce the word to be spelled, he will do so before and after the spelling to identify the word. Unless block capital letters are difficult, I SPELL is not used.

EXAMPLE A (a pronounceable word):
"Catenary . . . I SPELL Charlie Alfa Tango Echo November Alfa Romeo Yankee-Caternary."

EXAMPLE B (an unpronounceable abbreviation):
"Moving to NSW State HQ" is transmitted as: "Moving to I SPELL November Sierra Whiskey-State I SPELL Hotel Quebec."

12. PRONUNCIATION OF NUMERALS

(a) To distinguish numerals from words similarly pronounced, the proword "FIGURES" may be used preceding such numbers.

(b) When numerals are transmitted the following rules for their pronunciation will be observed:

Numerals	Spoken as	Numerals	Spoken as
0	Zero	5	Fi-yiv
1	Wun	6	Six
2	Too	7	Seven
3	Thuh-ree	8	Ate
4	Fo-wer	9	Niner

(c) Numbers will be transmitted digit by digit except that exact multiples of hundreds and thousands may be spoken as such.

Number	Spoken as
44	Fo-wer-Fo-wer
90	Niner Zero
136	Wun Thur-ree Six
500	Fi-yiv Hun-dred
1478	Wun Fo-wer Seven Ate
7000	Seven Thow-zand
16000	Wun Six Thow-zand
612881	Ate Wun Too Six Ate Wun

(d) The figure "zero" is written "ø".

(e) The Decimal Point is written as "pt" and transmitted as "point".

13. MIXED GROUP

In giving a mixed group of letters and figures, the prowords FIGURES and I SPELL are used as in the following examples:

The mixed group 31AB7 is sent as follows:

FIGURES three one — I SPELL Alfa Bravo — FIGURE SEVEN.

14. PUNCTUATION

In sending capital letters or punctuation, the following phrases are to be used:

(a) "Blocks on" and "Blocks off".
(b) "Stop".
(c) "Brackets on" and "Brackets off".
(d) "Oblique" (/).
(e) "Quote" and "Unquote".
(f) "Hyphen".
(g) "Point" (written as "pt").

15. NET DISCIPLINE

(a) TRANSMISSIONS ARE TO BE AS SHORT AS POSSIBLE, CONSISTENT WITH CLARITY.

(b) The procedure described in this paper should be followed. If the procedure does not cover a specific operating requirement, use commonsence to deal with the situation.

(c) Departures from the standard procedure invariably create confusion and reduce accuracy and speed.

(d) The following basic rules are essential for simplicity and efficiency.

(1) No transmission is to be made which has not been authorised by proper authority.

(2) The following practices are to be avoided:
— Unofficial conversations between operators.
— Transmitting in a directed net without permission.
— Excessive tuning and testing.
— Use of plain language in place of appropriate prowords.
— Speaking faster than the receiving operator can be expected to write.

16. OPERATING RULES

(a) To save circuit time, all messages should be written down prior to transmission. Messages preceded by the proword "MESSAGE" are to be written down by the receiving operator.

(b) Transmissions must be kept as short as possible and the use of prowords enhances brevity. Every transmission must be concluded with the proword "OVER" or "OUT" as appropriate.

(c) Transmission should be clear with natural emphasis on each word and should be spoken in natural phrases, not word by word. Special care must be taken with the transmission of numerals.

(d) To avoid interfering with other traffic, a user should listen on the circuit before transmitting.

(e) When it is necessary for a station to indicate test signals, either for the adjustment of a transmitter before making a call, or for the adjustment of a receiver, the signals are not to continue for more than 10 seconds and will be composed of spoken numerals (1, 2, 3, etc.) with the call sign of the station transmitting the signals.

17. RADIO NETS

Radio nets may be "Free" or "Directed". Under conditions of light traffic and well-trained and disciplined operators, a net may be termed "Free", and Control will not intervene in direct communication between substations. Where traffic is heavy however or the standard of training and discipline is suspect, Control must exercise control over the net and all messages between substations will be offered. Control will be the first to answer these offers and will be able to regulate all traffic on the net.

18. NET LOGS

(a) Net logs are to be maintained, when ordered.

(b) The net log normally shows a complete and continuous record of operating conditions and all transmitted and received traffic. The log should include such data as the following:

(1) The time of opening and closing of the station(s), etc.

(2) Causes of delays on the net.

(3) Frequency adjustments and changes on radio channels.

(4) Unusual occurrences such as procedure violations, equipment faults, etc.

(5) Signal Strength Reports.

(c) When opening a new net or starting a new day's log or the operator is relieved or closes the net he is to sign the log. The oncoming operator is to then write his name on the log.

19. LOG SHEETS

Log sheets should contain spaces for date, time, call to, call from, and event or text or message identity.

WICEN INVOLVEMENT IN NDO EXERCISE COMCOORD 2

The annual Natural Disasters Organisation exercise for the Natural Emergency Operations Centre (NEOC) was held from 7 to 9 November 1979. The simulated emergencies were a cyclone in Darwin and an earthquake in Adelaide. The Darwin and Adelaide Emergency Operations Centres were manned and in contact with the NEOC in Canberra.

WICEN was involved in passing typical pre-prepared messages from Darwin and Adelaide to Canberra over the period 0900Z 7 November until 1000Z 8 November 1979.

The Darwin circuit was worked on RTTY and showed a 92 per cent availability, however this was reduced to 79 per cent workability due to operator unfamiliarity with RTTY.

The Adelaide circuit was scheduled for SSB from 0200Z until 1100Z and achieved a 56 per cent availability due in the main to a late path being established. A check of the propagation predictions showed a daytime ALF of 6.9 MHz, together with an E layer MUF of 13.7 MHz and F layer MUF of 12.5 MHz. In retrospect this difficulty should have been anticipated and relay stations alerted or put on standby.

The message rate was low, only four or five messages were passed from each outstation, but they were designed to be representative of the type of traffic that would occur.

The WICEN involvement demonstrated the need for operator training and circuit planning, also the value of RTTY when a good path exists. It is our only national WICEN exercise, it demonstrates our abilities to NDO and state SES and provides us with necessary experience.

Thanks are due to the roster of operators who worked from South Australia and manned VK1WI, also to VK8HA, who "went it alone from the top".

WICEN-WA ACTIVITIES REPORT

1. The year of 1979 to present date has been fairly active for WICEN-WA. Listed below are the activities we have been involved in:

24 February, 24 March, 28 April, 26 May: Halliday field exercise with LVES and German Shepherd dog tracker team.

30 June: Full day as above, including simulated aircraft crash.

2-3 July: Operation search for lost youth, Yanchep.

3-4 August: 24 hour Regional exercise "Long Stop" based on earthquake situation, with at least 350 incident reports.

15 September: Day Regional HQ internal exercise "Home Base", similar to CP telephone battle.

21 October: Communications task for the Neurological Foundation of Australia during a Fun-Run.

All activities applied for and approved by P. and T., Perth, with no difficulty.

2. The WICEN-WA Group has been integrated into the HQ Metropolitan (Perth) Region, State Emergency Service and is responsible for the manning and operation of the Communication Room. Members operate the Control Set of the Metropolitan Command Net (Voice). The ability is there to use the Communications Room for State-wide operations.

3. The somewhat small RTTY Group in WA has also accepted a role within WICEN structure and there are current plans to install a permanent terminal in the Communications Room. Hopefully this may be achieved before the Christmas 1979 holidays.

4. A small reconnaissance detachment has been formed with the object of not only being used for back-up communications but to act as the eyes of the Area Co-ordinator (Metropolitan). We will have to do more work on this plan and obviously try it out.

5. It is my intention to curtail the training programme over the summer months. Naturally we would have to cope with school holidays and I feel we must retain some resources as the summer months usually bring out a share of search operations.

6. I believe that WICEN-WA is firmly established, though not large in active strength. State Emergency Service Officers appear to be quite satisfied with the situation and we are information for a lot of the writings.

S. A. Jenkins, Co-ordinator WICEN-WA.

WICEN NORTH QUEENSLAND ACTIVITIES REPORT

The WICEN plan for North Queensland has recently been revised.

Since preparing the original plan several years ago the organisation has grown considerably, especially with the introduction of the novice licence and the migration of amateurs from other areas.

Effective coverage has also increased and more remote areas now have one or more permanent amateur operator residents.

All these factors necessitated a change in the planning and operation of WICEN networks within the Zone.

The plan has been approved by the P. and T. Department (Queensland).

Reproduction has been carried out by the Cairns office of the SES and the plan is incorporated in their local disaster plans for North Queensland.

You may be interested to know that the Cairns Club has been successful in negotiations with Telecom for the installation of the Club's 2 metre repeater (VK4RCA Ch. 8) at the TV station on Mt. Bellendanker (5200 ft. AMSL), and a proposal has been put to the Townsville Club for linking through their repeater on Mt. Stuart.

Also this Club has been donated a model 15 teletype machine, and as several local amateurs, including myself, are becoming active on RTTY, this gives WICEN another useful model for handling emergency traffic.

Ted Gabriel VK4YG. ■

20 YEARS AGO

Ron Fisher VK3OM

JANUARY 1960

A new decade and the Editorial page takes a look at the possible outcome of the just completed ITU Conference. It seems that we might be in the same situation at the present time. It was suggested that we would lose 100 kHz off the top end of 80 and 50 kHz off the top end of 40. We did. The final words are worth repeating, "Put your transmitter on the air regularly; encourage others to do the same; encourage young people to take up Amateur Radio as a hobby and encourage your friends to join the WIA". On the technical side, SSB was starting to show up as the thing to be in. The AR7 and SSB. C. Cullinan VK3AXU described the addition of a product detector to this still popular receiver.

Transistorised equipment was the in thing in the early sixties, but many were trying to resist the change. We went through a period where many tried to run tubes with 12 volts HT. In fact a special series was brought out designed with just this in mind. Several commercial car radios were marketed using these, often with transistor audio output. Taking the reverse approach V. Kerr VK4LK described a valve audio system working with a 12 volt HT. Many were building SSB transmitters about this time and most used the phasing method. Lining the thing up was always a problem but Stan VK2EL described a simple method using a receiver as the main piece of test gear.

ATV was in the news in 1960. Flying spot scanners were the in thing. Call signs mentioned were VK2AWW, VK5AO, VK3AUX and the late VK3BU of Geelong Short Wave Listener groups were very active and an action packed page of notes was a feature of AR. Maurice Cox L3055 was the driving force behind this informative section. ■

QSP

THOUGHT FOR THE MONTH

"Those who persistently trigger repeaters without saying anything perhaps would rather have people wonder why they don't say anything rather than come out with a comment and then leave people wonder why they bothered to say anything."— Break-In. ■

ADVERTISERS' INDEX

EXECUTIVE OFFICE

HAS MOVED

NEW ADDRESS:

3/105 HAWTHORN ROAD
CAULFIELD NORTH

Tel. No. not yet known

Postal address unchanged:
P.O. BOX 150, TOORAK 3142

HAMADS

- Eight lines free to all WIA members. $9 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Toorak, Vic. 3142.
- Repeats may be charged at full rates.
- Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTHR means address is correct as set out in the WIA 1979 Call Book.

FOR SALE

Kenwood TS-820S Transceiver, mint cond., $565, ONO. VK3OM, QTHR. Ph. (03) 560 9215.

Yaesu FRG-7 Rx, little use, good cond., digital clock, price $150, ONO. Rob L50355, QTHR.

Yaesu Linear FL2100B, new cond., $400; Swan mobile whip, all bands, 1 kW, $100. Bill Hempel VK1BH, QTHR. Ph. (062) 88 6002 A.H., (062) 65 5385 Bus.

ICOM IC701 HF Txcvr and IC701 PSU, mint cond., mic., manuals, no mods., $1300; Yaesu FRG7 comm. recvr., .5-30 MHz, late model, slow reduction drive and narrow filter for SSB as per AR mods., exc. cond., $250. B. Bathols VK3UV, QTHR. Ph. (03) 90 6424 A.H.

Yaesu Tcvr FTDX400 with adjust. effective noise blankers, spkr., set of 19 valves and manual, clean, in original working order, $340, ONO. VK2AOU, QTHR. Ph. (02) 53 9789 A.H., (02) 807 0484 Bus.

FT200, complete with power supply and microphone, $350. VK3BVK, 50 Fisher St., Torquay. Ph. (03) 329 0160 Bus.

TS-520S, with mic., SWR meter and ant. coupler, with instr. manuals and orig. boxes, $560; portable double conversion Rx, 5 bands, MW plus 3.8-28.5 MHz, with BFO, xtal freq. marker, band spread dial and carrying case, $86; both in excellent cond. VK3VBF, QTHR. Ring Ken (03) 857 7261 evenings.

Drake SSR1, complete with orig. packing box, book and accessories, $165. Contact David Deerman, 222 Parry St., Charleville, Q. 4470. Ph. 278.

Multi-Palm II Hand-held 2m Tcvr, rptr. 2, 3, 5 and 8, simplex 40 and 50, as new cond., also nicads, charger, leather case, $230, ONO. VK3BNJ. Ph. (03) 743 6708.

Drake TR4C Txcvr, complete with noise blanker fitted, 240V AC, 12V DC PSU and set of spare final tubes and driver tubes, exc. cond., $750 the lot; MFJ SSB filter, $15.00; Quasi-Logarithmic speech Proc. by New England Eng., $30. Alf Chandler, QTHR. Ph. (03) 99 5344.

SILENT KEYS

It is with deep regret that we record the passing of —

Mr. A. P. BALTHASAR	**VK2IH**
Mr. R. J. LENNON	**VK1TV**

Yaesu FT101E with matching speaker, mic., manual, exc. cond. Trevor VK3NMJ, QTHR. Ph. (03) 789 3129.

Eddystone General Coverage Rx, model 1830/1, 9 bands, continuous 120 kHz-31 MHz, 6 xtals fitted, fully solid state, extension plinth spkr. fitted, owner's manual, very stable, perfect cond., model used by many commerc. orgs., $1,500. L30605, QTHR.

HC500A ATU, 500W, with book, as new, $100; Micronta SWR/PWR meter, 10/100/1000W, as new, $30; EA electronic keyer, wired and tested OK, $35; 13.8V 2A reg. power supply, $20. VK1KV, QTHR. Ph. (062) 88 1767 AH, (062) 45 3522 Bus.

Hy-Gain Quad, 20, 15, 10m, single coax feed, exc. cond., need the space on the tower for VHF array, $160. B. Bathols VK3UV, QTHR. Ph. (03) 90 6424 after 7.00 p.m.

SB200 2m Transverter, $125; FT75 HF transceiver, with ext. VFO, xtals, 240V and 12V supplies, $295. VK3AFW, QTHR. Ph. 579 5600 AH.

Contents of VK1 Div. Parts Box, incl. light dimmer kits, ST6 RTTY demod. PCB and photo neg., misc. PCBs for keying monitor and FM alignment osc., PN3565 xtrs, pot cores, small necsid coil formers with F25 slugs and other hardware, 3 x 5 in. reels Apex rec. tape, ¼ in. x 600 ft., misc. pots. Please send for list to Box 48, Canberra, ACT 2600, or John Tilley VK1FT, QTHR.

Yaesu FT200 with matching PSU, mic., handbook, FT200 club notes, exc. cond., $400. P. Wilmott L31159, QTHR. Ph. (03) 772 1802.

RTTY Gear, model 15 printer, $55; model 14 reperforator, $35; both 45 baud and v.g.c. VK3YLH, QTHR. Ph. (03) 754 4974.

TS820/S, CW filter, spkr., MC50, mic., $750; TSI20/V, CW filter, HH mic., $460; TR7400, mic., but damaged mobile bracket, $350; Dentron MLA2500/B, modified for 28 MHz, $800; home-brew 100W in broad band linear, suit TSI20/V, $75; home-brew ant. tuner, with SWR and power meter, bal. or unbal. feeder, $130; AT-120 tuner, suits TS-120, $70; home-brew electronic keyer with memory and MK701 paddle, $150; FRG-7 Rx, $200; Hansen RMS-PEP power meter FS-600A, $60; most items under 1 year old, cartons and manuals; will sell to licenced amateur only. VK2BOT, QTHR. Ph. (02) 623 4856 AH.

WANTED

VHF Radio, AN/ARC 48 HF radio 618S-1A, UHF radio AN/ARC51BX, DME control panel VAN 5, intercommunication control panels AN/A1C 18 (3 if possible), radio compass indicator I-75-A, panels or complete units if possible. Information to Mark VK3NOY. Ph. (03) 478 8726 AH.

Heathkit SB-620 Spectrum Analyser, offering $100. Bruce Hedland-Thomas VK6OO, 27 Parsons St., Embleton, WA. Ph. (09) 271 0649.

Uniden 2020 or Tempo 2020 Tcvr., working or not, with or without accessories, pay up to $350; freight paid. VK6ZOO, QTHR. Ph. (089) 27 2003 AH.

VFO-520S External VFO for Kenwood TS520S. VK2DDS, was VK2NPS, QTHR. Ph. (065) 52 3464 after 6.30 p.m.

Yaesu FT221 2m Tcvr. Details to Mark Ph. (08) 389 1204 after 0800 GMT.

TRADE HAMADS

Amidon Toroids, refer ARRL Handbook. T200-2 $5 ea., T106-2/6 $3 ea., T50-2/6/10/12 $1.20 ea., T25-2/6/10/12 70c ea. Orders over $10 less 10%. P & P 60c. SAE for information. US Imports, Box 157, Mortdale, NSW 2223. Tel. (02) 579 3849.

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The RF amplifier and first mixer circuits using MOS FET's, and other circuits provide excellent Cross Modulation and Two-Signal Selectivity characteristics. The IC-251A has excellent sensitivity demanded especially for mobile operation, high stability, and with Crystal Filters having high shape factors, exceptional selectivity.
The transmitter uses a balanced mixer in a single conversion system, a band-pass filter and a high-performance low-pass filter. This system provides distortion-free signals with a minimum spurious radiation level.

* **BACK-UP SUPPORT**
Backed by Vicom spares and technical support, together with 90 day warranty.

IC-251A Typical Technical Characteristics: General. Numbers of semiconductors: Transistors 99, FETs 12, ICs 37, Diodes 132. Frequency coverage: 143.8000 — 148.1999MHz. Frequency resolution: SSB 100Hz steps FM 5KHz steps. 1KHz steps with TS button depressed. Frequency Control: Microcomputer based 100Hz step Digital PLL synthesizer. Independent Transmit-Receive Frequency Capability. Frequency Readout: 7 digit LED 100Hz readout. Frequency stability: Within ±1.5KHz. Memory channels: 3 channels, any inband frequency programmable. Usable conditions: Temperature: — 10°C — 60°C (14°F — 140°F). Operationable time: Continuous. Antenna impedance: 50 ohms unbalanced. Power supply requirement: 13.8V DC ±15% (negative ground) 3A Max. or 240V AC ±10%. Current drain (at 13.8V DC): Transmitting, SSB (PEP 10W). Approx. 2.3A. CW, FM (10W). Approx. 2.3A. Fm (1W). Approx. 1.0A. Receiving. At max audio output. Approx 0.6A. Squelched Approx 0.4A. Dimensions: 141mm (h) x 241mm (W) x 264mm (D). Weight: Approx. 5.0 Kgs. Transmitter. Output power: SSB 10W (PEP). CW 10W. FM 1 — 10W (Adjustable). Emission mode: SSB (A3J, USB/LSB). CW (A1). FM (F3). Modulation system: SSB Balanced modulation. FM Variable reactance frequency modulation. Max. frequency deviation: ±5KHz. Spurious emission: More than 60dB below peak power output. Carrier Suppression: More than 40dB below peak power output. Unwanted Sideband: More than 40dB down at 1000Hz AF input. Microphone: 1.3K ohm dynamic microphone with built-in preamplifier and push-to-talk switch. Operating mode: Simplex, Duplex. (Any inband frequency separation programmable). Receiver. Receiving system: SSB, CW Single conversion superheterodyne. FM Double conversion superheterodyne. Receiving Mode: SSB A3J, USB/LSB, CW (A1), FM (F3). Intermediate Frequency: SSB, CW 10.7MHz. FM 10.7MHz, 455KHz. Sensitivity: SSB, CW Less than 0.5 microvolts for 10dB S+N/N. Fm More than 30dB S+N+D/N+D at 1 microvolt. Less than 0.6 microvolts for 20dB Noise quieting. Squelch sensitivity (FM only): Less than 0.4 microvolts. Spurious response rejection ratio: More than 60dB. Selectivity: SSB, CW More than ±1.2KHz at — 6dB point. Less than ±2.4KHz at — 60dB point. FM More than ±7.5MHz at — 6dB point. Less than ±15MHz at — 60dB point. Audio output power: More than 1.5W. Audio output impedance: 8 ohms.

VICOM

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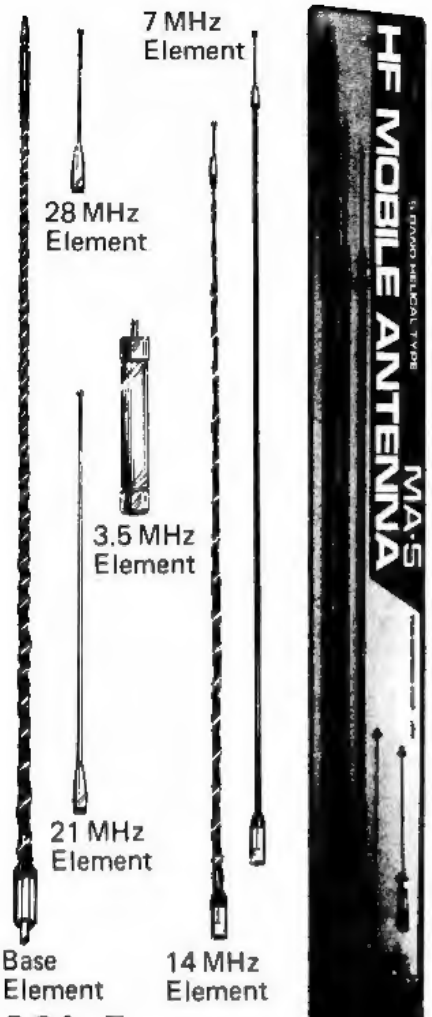

MA-5
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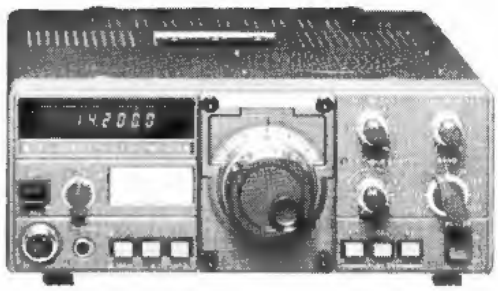

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TS-180S...	$1240	SP-180...	$63	TS-120S...	$735	MC-35S...	$26
AT-180...	$161	VFO-180...	$169	AT-120...	$96	TR-7625...	$455
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MC-50

AT-180

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